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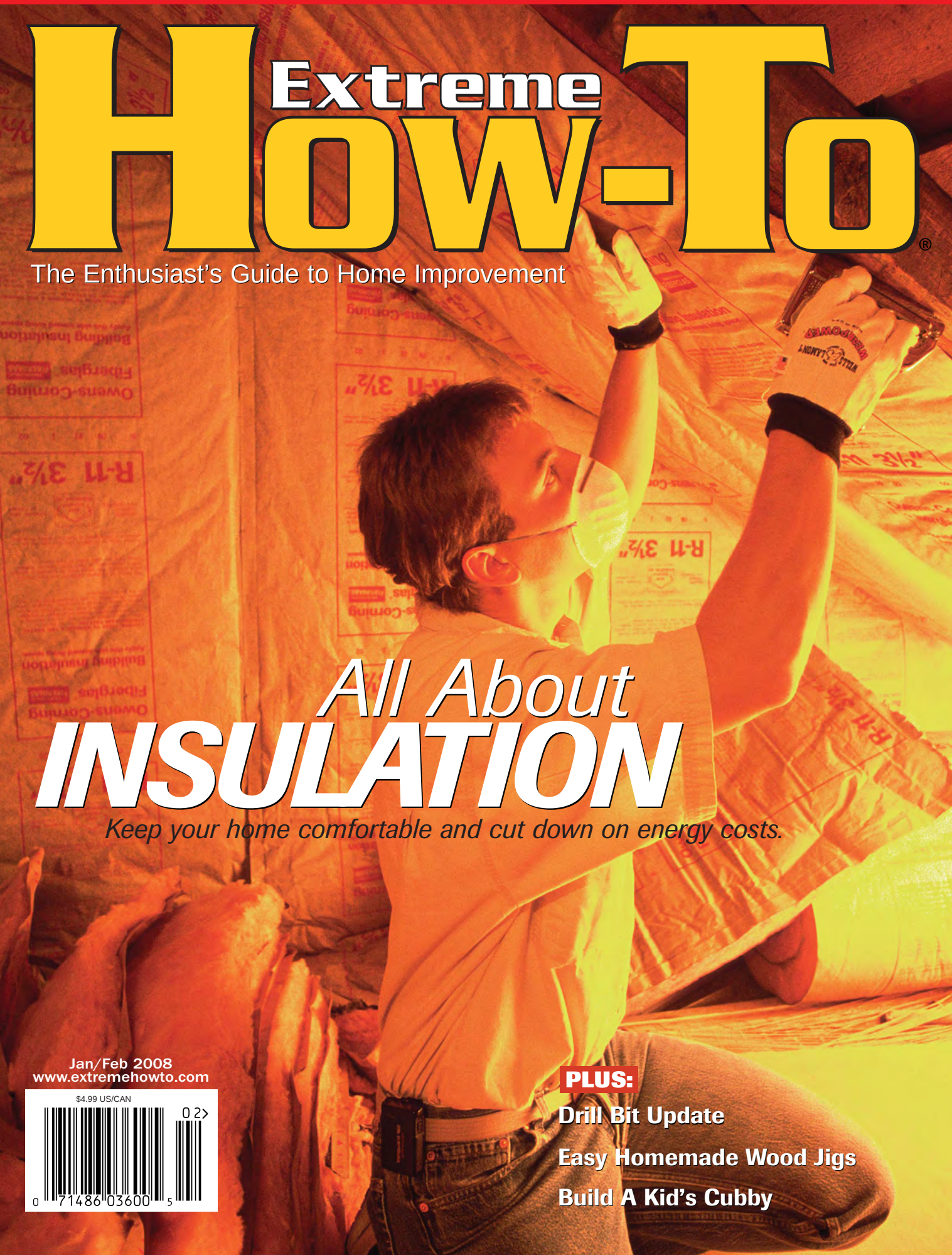

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What You Need To Know About Dust Containment

Safety concerns are making dust containment a huge issue for those who work with power hand tools. The airborne particles created by sawing, sanding and grinding of concrete, stone, drywall, wood and fiberglass pose a serious health risk. OSHA has implemented guidelines to protect workers from exposure to silica[1] and Hexavalent chromium[2]. A recent NIOSH Health Hazard Evaluation found that drywall sanders were exposed to as much as 10 times the permissible exposure limit set by OSHA.

Everyone is scrambling for a solution. OSHA is developing new guidelines. Some insurance companies have actually dropped coverage because of the immeasurable legal exposure. Dust masks help, but the industry has found a better solution in point-of-origin dust containment systems.

One company, Dustless Technologies, has developed line of solutions around a patented vacuum design. The system includes a variety of muzzles/shrouds designed to fit a wide array of tools including hand grinders, worm-drive saws, high-speed saws and core drills. There is also a pole-mounted dry wall sander and paint scraper.

Originally developed for the purpose of cleaning ash out of fireplaces, the Dustless Wet/Dry vacuum is uniquely capable of capturing the extremely fine dust created by

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sanding, sawing and grinding. Traditional shop vacs "cough" out a cloud of dust when you turn them on if they're filled with something like drywall dust. Additionally, you have to open up the unit to clean the filter, allowing more dust to escape into the work environment. Not so with the Dustless system.

The patented dual filtration system enables you to clean the primary filter with an agitator rod without opening the unit. An optional micro-prefilter provides an extra five layers of filtration to capture airborne particles down to .5 microns. For the ultimate in dust containment, there is also an optional HEPA filter that captures particles down to .3 microns.

In addition to safety issues, contractors have discovered tremendous time-saving benefits from eliminating clean up. Darren Diess, Vice President of Sales and Marketing for Dustless said, "Contractors save a lot of time and money with our system. Consider the mess created by drywall sanding... Now eliminate it - and all the work that goes with it. Our system is also priced to be within reach of the smallest contractor or do-it-yourselfer. Professional-grade dust collection systems cost typically more than a thousand dollars, whereas our systems start for less than $400."

[2] Industrial uses of hexavalent chromium compounds include chromate pigments in dyes, paints, inks, and plastics; chromates added as anticorrosive agents to paints, primers, and other surface coatings; and chromic acid electroplated onto metal parts to provide a decorative or protective coating. Hexavalent chromium can also be formed when performing "hot work" such as welding on stainless steel or melting chromium metal.

[1] Materials including, but not limited to, concrete, brick, block, mortar, stone, rock and soil.

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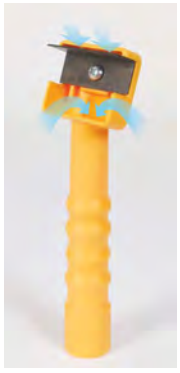

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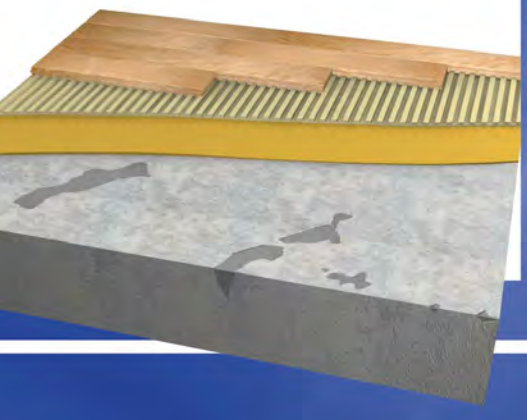

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From the EDITOR

You know what this world needs? More bureaucracy.

The U.S. congress is attempting to federalize the state building code process. This is so the government can mandate energy-efficient building practices. That sounds noble on paper, but the problem is that everything the federal government touches turns to mud. Vast, ineffective bureaucracies filled with stuffed shirts and lobbied partisans shouldn't be calling the shots in the building sector. We should leave that to people who know what they're talking about—like the National Association of Home Builders.

On October 17 the NAHB addressed congress regarding the matter. "Congress should be promoting voluntary energy-efficient programs," said Frank Thompson, a Pennsylvania home builder. He argued that rather than forcing these policies down the throats of Americans, maybe We the People should have the opportunity to decide for ourselves on a local or state level the way we should build our homes and live our lives … this being the Land of the Free and all.

Furthermore, not only does federal intervention have a track record of gross, preposterous inefficiency, but the tax-paying citizens get to foot the bill. Thompson continued, "Establishing mandatory benchmarks and rigorous federal oversight for state building codes would subvert the consensus-code development process, violate states' rights and impose unwanted and exorbitant costs on home buyers."

Exorbitant costs for John Q. Public: Your government at work.

I feel confident that the NAHB, members of which build 80 percent of all new homes in the U.S., are much better qualified to address energy-efficiency in home construction than any elected official. In fact, the NAHB has been engaged in several public-private partnerships and sponsored many events to drum up awareness for energy-efficient building. The NAHB is also a partner of the Department of Energy's Energy Star Home Program, which has resulted in more than 750,000 homes built to code-exceeding standards. The NAHB is addressing energy efficiency the right way, with a measured approach that makes sense for specific localities. Congress seems to overlook that the efficiency needs for homes built in Florida vary greatly from those built in New Mexico. Any overarching encroachment from a federal agency is sure to saddle builders with arbitrary code increases, the cost of which will be passed along to homebuyers.

If congress really wants to effectively promote energy-efficient building practices, they should extend the federal tax credits that passed as part of the Energy Policy Act of 2005. Aside from that, they should stay out of the way and let the builders do what they do best.

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Got a ?

Questions About Home Building, Remodeling? Have Your Own How-To Tip? Visit our website at **www.extremehowto.com** and click on Home Repair Forum.

Q. *I bought a new range hood that requires a 7-inch duct size. The old range hood uses a 4-inch duct size, which is already built inside the walls and ceiling of my house. To change it to a 7-inch duct would require some major remodeling that I'd like to avoid. Is it okay to let the new range hood use the 4-inch duct size?*

A. When comparing different sizes of pipe or ducting you should consider the cross-sectional area. The formula is *Large diameter squared divided by Small diameter squared*. A 7-inch duct compared to a 4-inch duct breaks down as follows:

N= (7x7) / (4x4), N= 49/16, N= 3.06

This means a 4-inch duct has only 1/3 the capacity of the required 7-inch duct. The fan will operate using the 4-inch duct, but to do so, the internal working air pressure and velocity of flow will be much higher. This will likely result in vibration, excessive noise and possibly overheat the fan motor.

Q. *I am installing homemade 1-by-4 trim on interior doors, and found that the surrounding drywall is not flush. It seems as if the studs that frame the door are warped, leaving 3/16-inch gaps against the wall. How do I fix this?*

A. Most purchased door trim has a wide groove milled along the length of the trim on the back side. This groove helps to accommodate any drywall edges that are not flush. If you don't have this groove milled in your trim, use a router to cut at least a 1-inch wide, 1/8-inch deep groove in the back that will line up with the drywall-to-jamb joint.

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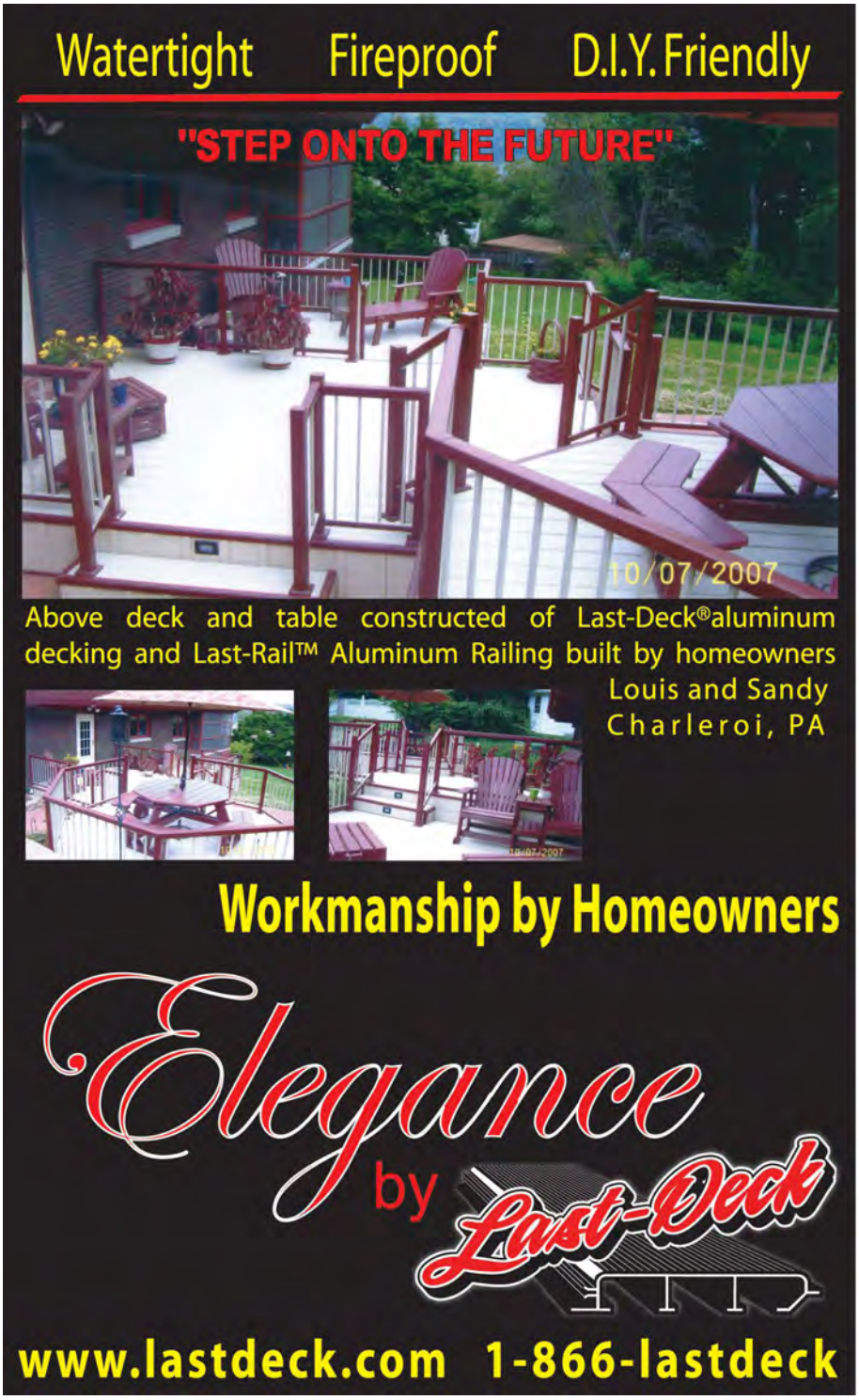
Q: *I'd like to build a curved deck like I've seen on other homes, but how do I go about making a curved band joist?*

A: The deck joists are supported by beams and posts from below. Install the deck joists running long, and then use a trammel to mark the curve along the tops of the joists. Draw plumb lines on the joists and cut them off according to your curved pattern. Use the cut-off joist material as blocking between each joist end—two blocks between each, one flush at the top and one at the bottom. Install the top blocks first, cut the circular pattern in each and use the tops as a template to cut the bottom blocks. The curved band joist that fits over the deck-joist ends and blocking is made by laminating three layers of 1/2-inch pressure-treated CDX plywood cut into strips to match the joist width (typically 7-1/2 inches wide). As you laminate the plywood strips, stagger the joints between the layers and use plenty of construction adhesive, clamps and 8d galvanized nails to secure them.



Q: *I'm installing new tile in a bathroom and have stripped the floor down to the tongue-and-groove subfloor, and it appears to be very level. My question is this: Is it absolutely necessary to first lay mortar beneath the cement board? I may want to eventually pull up the tile to lay a new floor, but I don't want to have to pull up the mortared subfloor in the process. If I install a good moisture barrier beneath the tile, is bonding mortar absolutely necessary?*

A: If you're certain the subfloor is absolutely flat and in the same plane, then you might get away with skipping the mortar. The bonding mortar beneath cement board is intended to fill any voids or dips between the cement board and subfloor. If a void exists, the pressure of walking over that spot can cause the floor to be pushed downward. Because tile is so brittle, this pressure can crack it.

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By Matt Weber

Drill Bit Update

Drill bits are indispensable tools for the professional contractor as well as the DIY homeowner, and new technologies are giving these toolbox staples more cutting power than ever before. In this article *EHT* explores a wide range of bit types, their various applications, and the latest technology to increase cutting efficiency.

Modern materials and advanced designs make the today's drill bits more efficient than ever. Shown are Vermont American's Titanium-coated twist bits. The titanium coating lasts six times longer than standard high-speed steel bits.

Twist Bits and Common Materials

The standard twist-type drill bit is the most mass-produced drill bit on the market. The geometry and sharpness of the cutting edges determine the performance of the bit. The most common twist bit has a point angle of 118 degrees, which is suited for all sorts of general purpose tasks. Sharper points, such as a 90-degree angle, provide more aggressive cutting power for materials such as soft plastics. A shallower tip angle, such as 150 degrees, is designed for applications such as drilling steel (but requires a starter hole). The general rule is that harder materials require a large point angle, and softer materials require a sharper angle.

Today's twist bits are available in several material types. Soft, low-carbon steel bits are inexpensive, but are only used in wood and require frequent sharpening or replacement. High-carbon steel bits are somewhat more durable and can be used in metal or wood, but excessive heat can damage the cutting edge. For better quality and a step up in hardness, high-speed steel bits (HSS) are more tolerant of heat and can drill through softwoods, hardwoods and metal.

Exotic materials are now being used to ramp up the performance of today's bits. For example, the Cobalt bits from Bosch are designed for drilling the toughest materials, like hardened stainless steel, cast iron and titanium. These bits combine HSS with 6-percent cobalt, which results in a bit that resists up to 1,100 degrees Fahrenheit to drill extremely abrasive materials that would normally destroy other bits.

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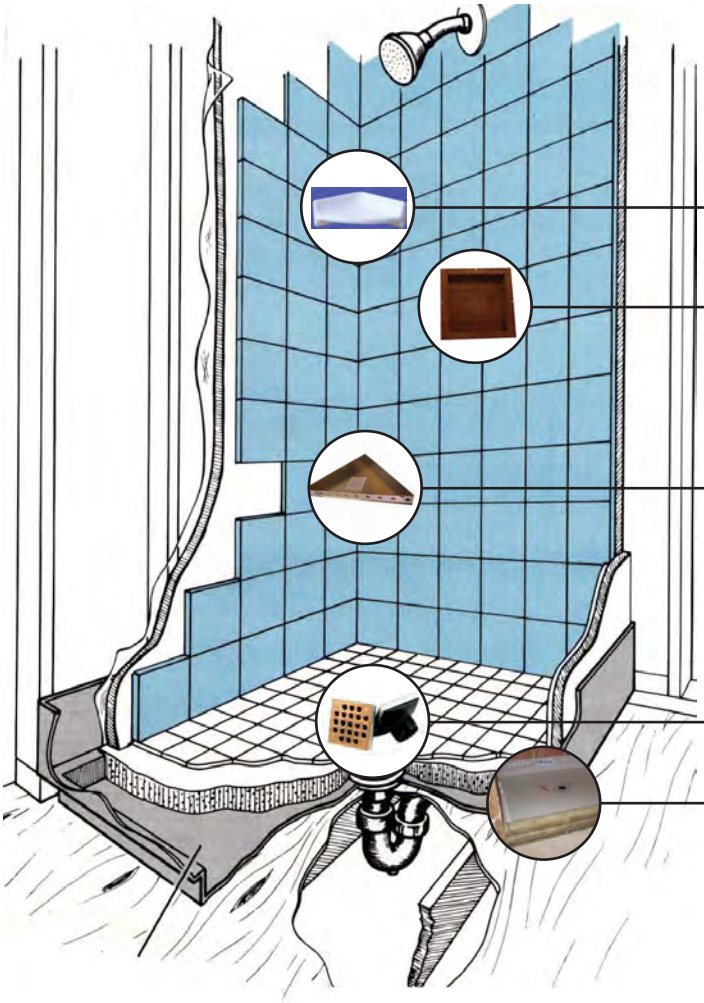

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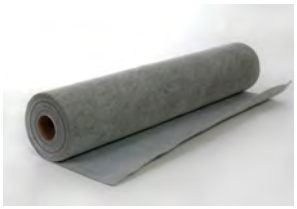

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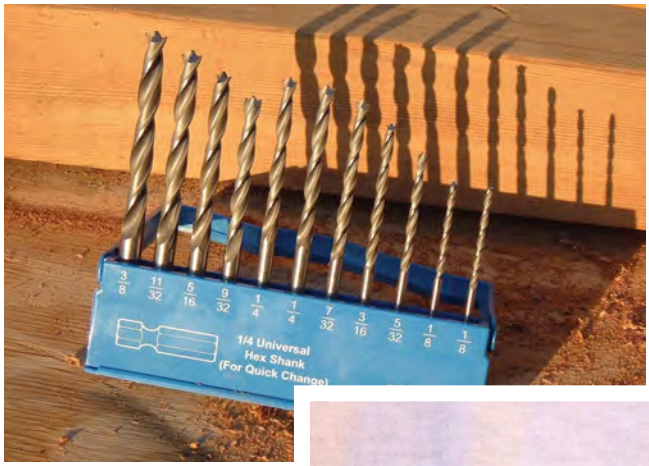

Above: TG Tools' Kik brad-point bits provide 20-percent more cutting surface than standard brad-points.

Vermont American's self-feeding spades are now available in short "Stubby" lengths. The bits feature a threaded spur that pulls the bit into the wood.

Tungsten Carbide is an extremely hard material that will stay sharp longer than other bits. However, because the material is so brittle, these bits are typically made of HSS and "tipped" with tungsten carbide, so the bits maintain strength and cut down on cost.

Coatings are another hot trend in drill bits. Heat is the single largest hindrance in the life of the bit, and high-tech coatings help resist heat. A Black Oxide coating can double the life of standard HSS bits for all-purpose drilling in wood, plastic, carbon and alloy steels, aluminum and soft cast iron. Titanium Nitride coating is a very hard ceramic material, and can dramatically extend the life of the cutting edge when used to coat HSS bits. Titanium-coated bits will last up to six times longer than standard Black Oxide bits and cut through more materials.

Diamond powder is another coating used as an abrasive for cutting ceramic, stone and even glass. Diamond bits generate a lot of heat, though, and should be used with water to cool down the cutting process.

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Brad-point Bits

Standard twist bits can wander or skate across the work surface, especially if the bit in question has a wide point angle. In metalwork, drilling a pilot hole can compensate for this, but when drilling in wood, it saves time to use only one bit like a brad-point. Similar to a twist bit, a brad-point bit incorporates a spur with a sharp point into the tip of the bit. The sharp point penetrates the work surface to hold the bit in position while the sharp corners surrounding the spur cut the wood. Additionally, with the outside corners of the brad-point bit leading the cutting action, the wood fibers at the edge of the bore are cut for a cleaner hole. Brad-point bits are also effective in soft plastic, but are not generally used for metal because of their tendency to bind.

Thanks to more cutting edges and no center spur, the Kik spade bits from TG Tools can be used to drill curved holes.

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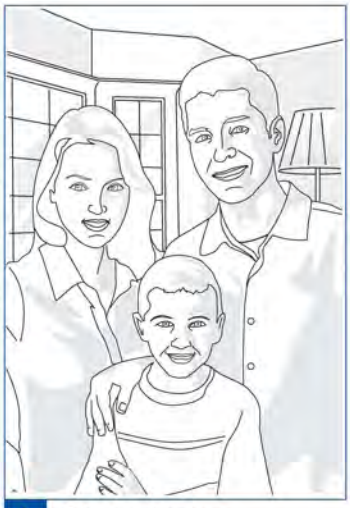

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In the next issue
Mold Project #3: Treating for mold during renovations

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The M.K. Morse hole saws have variable pitch teeth for smooth cutting in a variety of materials.

A new concept in brad-point design comes from TG Tools. The Kik brad-point bits from TG Tools are tipped with six cutting edges to provide 20-percent more cutting surface when compared to standard brad-points. This means the Kik bits bore faster, cleaner and last longer due to decreased wear. In fact, the tip cuts so aggressively that it necessitated an extraction ridge inside the flutes to remove material quickly and prevent heat buildup.

Spade Bits

For quick drilling of large holes, spade bits offer plenty of productivity with their paddle-like shape. A typical spade bit is flat with two cutting edges flanking a spur, which guides the trajectory of the drilling. It should be noted that spade bits are intended for rough-in work such as framing, plumbing and electrical work, because their aggressive cutting and high-speed action can leave a splintery hole.

One modern advance in spade-bit design is the inclusion of a threaded spur. For example, the latest spades from Vermont American feature an aggressive spur angle with a threaded tip which works like a screw and literally pulls the bit through the wood for fast cutting action. The self-feeding spades are also available in short "Stubby" lengths.

The spade bits from TG Tools employ the same concept as the company's brad-point line: more cutting edges. Engineered with 30 percent more cutting surface, the Kik spade bits result in faster boring and longer life. Plus, the Kik bits eliminate the spur commonly found on similar bits, which allows these spade bits to drill a curved hole. Great for plumbing and electrical installations, simply start the drilling as usual and you can angle a hand drill as you bore, altering the trajectory of the hole.

Hole Saws

They're called hole saws, but they fit on a drill—these cup-shaped bits cut out large circles or cores of wood for everything from plumbing to doorknob installation. The M.K. Morse bi-metal hole-saw set sold at Lee Valley

Bosch offers quick-change adapter nuts and mandrels that fit almost any manufacturer's hole saws. They make changing cup sizes a snap.

TECH TIP: DRILL PERFECT HOLES IN WOOD WITH NO TEAR-OUT

For drilling holes in wood with no tearout, there are two possible methods: For fine woodworking applications, use a backer board clamped to the workpiece. Select a good-quality bit with a starting point and side cutters, such as a Forstner or brad-point. The bit treats the two clamped pieces of wood as a single piece; as the drill bit passes through the workpiece and into the backer board, you won't get tearout on the workpiece. For applications where a precise hole is not required, use a spade bit to drill the hole. When you've just about pierced the backside, stop and flip the workpiece over. Use the hole pierced through the backside of the workpiece as a centering guide, and finish the hole from the backside.
—courtesy Vermont American, www.vermontamerican.com

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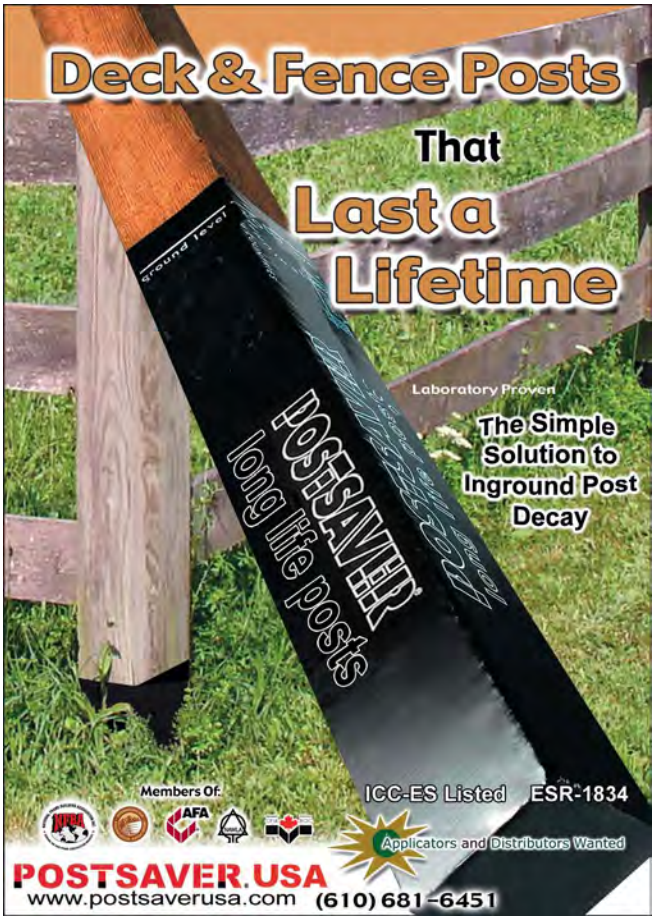
Century Drill's CoPilot hole-saw guide can easily enlarge precut holes.

Hardware features high-speed steel cutting edges bonded to a steel cup with the added advantage of variable pitch teeth. The repeating pattern of teeth and variable pattern gives smoother cutting in a variety of materials, when compared to the standard wavy pattern of teeth.

Bosch also has a new line of hole-saw bits that includes quick-change adapter nuts and mandrels that work with almost any manufacturer's hole-saw cups. (Mandrels are the centering bit and support piece that hold the hole-saw cups.) The quick-change system makes it easy to change cups in seconds and move effortlessly between applications, sizes and materials. Users simply attach the adapters to their cups, drill a hole, and pull back on the mandrel to change cup sizes in seconds. The quick-change system also eliminates the time-consuming task of digging the plug out from the middle of the cup.

Shown are Self-feeding wood bits from M.K. Morse.

Most hole saws are bi-metal with HSS tips, which are ideal for wood-boring applications. However, Bosch has recently introduced



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IT'S GREAT FOR: STONE AND BRICK MASONS PLUMBERS BUILDING INSPECTORS

Adjustable pilot bits pre-drill screw holes to prevent splitting wood. They can also countersink screw heads flush with the wood surface.

some "specialty" hole saws. Bosch's sheet-metal hole saw is equipped with a spring for automatic material ejection, variable tooth pitch optimized for fast, precise cutting and a lipped-edge that acts as a safety stopper. This lipped edge prevents breakthrough and leaves the work surface intact.

When working with especially dense materials, Bosch's new carbide hole saw has diamond-ground carbide teeth that are extremely powerful and durable with drop-shaped chip-clearance slots. The carbide hole saw cuts through wood, ceramic tile, brick and cinder block, cement board, fiber–cement board and plastic.

A new accessory for hole saws is a hole-enlarger kit to remedy holes that were originally cut too small. Simply attach the desired hole-saw size to the mandrel, and then use a special threaded center bit to attach the cup that drilled the original hole size. The first cup acts as a pilot guide so the second cup can accurately cut the correct hole size. Hole-enlarging kits are available from Century Drill and Tool as well as Vermont American.

Self-Feeding Wood Bits

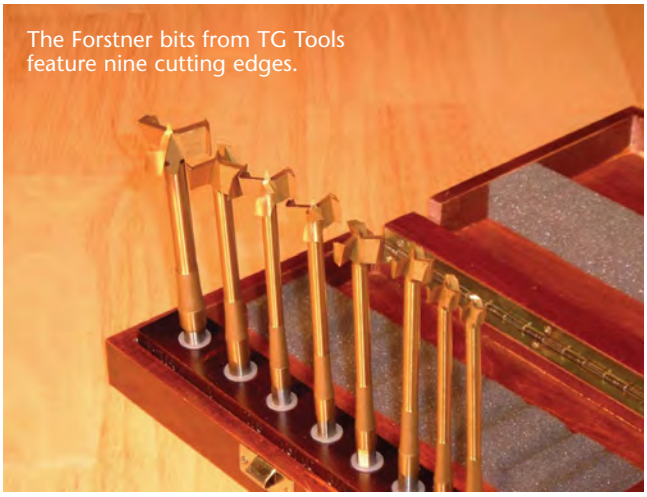
Self-feeding wood bits are used for large hole drilling, similar to hole saws. However, these bits don't cut cores of wood, they bore through it using a removable, replaceable feed screw that draws the bit into the wood, combined with a cutting plane that shaves the hole radius for clean, smooth holes without pressure. Self-feeding bits are available from M.K. Morse Company and Milwaukee Electric, and the cutting edges can be re-sharpened.

Countersink Pilot Bits

Countersink bits allow you to simultaneously pre-drill screw holes in wood and countersink the holes for recessed screw heads. These bits belong in every toolbox, but are often unduly overlooked by DIY'ers—and the result is split wood when driving the screws. Countersink bits are available in several sizes to match standard screw sizes. Some versions have an adjustable twist bit fitted into the countersink body. To match the bit length to the screw length, just loosen the hex nut on the countersink collar, slide the bit in or out, and then retighten.

Forstner Bits

Named after their inventor, Benjamin Forstner, Forstner bits are the best choice for drilling precise, flat-bottomed holes in wood. Forstner bits have a center spur



The Forstner bits from TG Tools feature nine cutting edges.

TECH TIP: DRILL ON A CURVED SURFACE

Here's a suggestion for drilling a hole on a curved surface, such as moulding. First, use an awl to start the hole in the exact location you want it on the workpiece. This minimizes the possibility of the bit "walking" or "skating" across the workpiece surface when you start to drill the hole. Next, using a twist drill bit, hold the bit perpendicular to that part of the curved surface of your workpiece, and begin drilling to a very shallow depth, no more than 1/8 inch. Once you get the hole started, sweep the bit into position so that it is parallel to the hole you are drilling. Then continue drilling to the desired depth. When finished, the hole will not be completely round, so you might want to use wood putty to plug the uneven hole.
—courtesy Vermont American, www.vermontamerican.com

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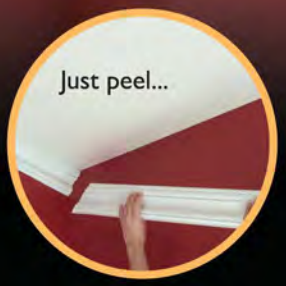

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as a guide and radial cutting edges that shear wood fibers at the edge and bottom of the hole, creating a smooth bore with an exact diameter. They can cut on the edge of a block of wood to create channels, and can also be used to create overlapping holes. Forstner bits require a lot of force to drive them into the wood, so they're typically used in a drill press. These bits also have no method of clearing wood chips, so they should be retracted periodically to clear the hole.

Forstner bits vary in design; some bits have two radial cutting edges, other bits have more. The Forstner bits from TG Tools actually have nine cutting edges, which permit cutting curved paths, channels, routing and milling in wood and plastics. The TG Tools Forstner bit set also come in a nice, dovetailed wooden box.

Vermont American's latest step bit can cut nine different hole sizes with a single bit.

TECH TIP: REMOVE PITCH BUILDUP FROM WOOD-BORING BITS

After extended use in gummy or sticky wood, a wood-boring bit can become coated with wood pitch. Pitch buildup causes the bit to drag, which can burn some hard woods. Any number of commercial products are sold that can clean and help prevent pitch buildup on bits and blades. Spray-on oven cleaners can do the job. As an alternative method, you can fill an empty coffee can with just enough paint thinner or de-natured alcohol to cover the bit. You must place a cover on the container, as solvents are flammable. Soak the bit overnight. Use a soft brush, such as a toothbrush, to get rid of any remaining residue, then wipe clean with a rag.
—courtesy Vermont American, www.vermontamerican.com

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Step Bits

Cone-shaped with a "staircase" profile, step bits can drill a wide range of hole sizes with a single drill bit. The new titanium step bit from Vermont American bores nine different hole sizes, from 1/4 through 3/4 inch in 1/16-inch increments. This single bit bores metal, wood, plastic and PVC. Plus, it automatically deburs the holes as it drills—a nice feature because burring can sometimes be a problem with standard step bits.

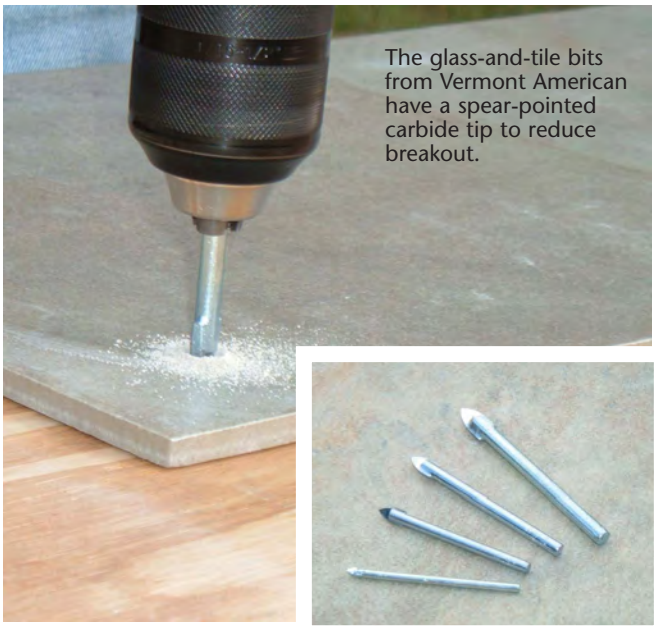
Auger Bits

Auger bits are great for boring deep holes to install plumbing or electrical lines. Because they're intended for deep drilling, they feature a long, deep spiral flute to effectively remove chips. A common 7-inch auger bit can drill through three 2-by-4's, although some versions, called ship augers, range in size up to 18 inches.

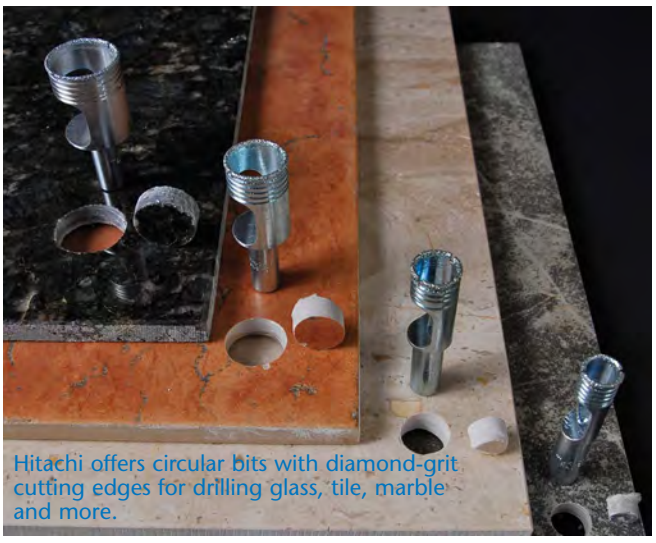
Glass and Tile Bits

Two types of bits are available for glass and tile drilling. The latest glass-and-tile bits from Vermont American have a spear-pointed carbide tip to reduce breakout. Available in 1/8, 3/16, 1/4, 5/16-inch sizes, these spear bits provide smooth, accurate drilling in ceramic tile, marble, china, mirrors and glass. The bits are ideal for drilling fastener holes in bathroom tile or wall mirrors.

A second concept for glass and tile, Hitachi offers a line of diamond-grit drill bits ranging in size from 3/16 to 1 inch. Utilizing a circular cutting edge, the new Hitchi bits are designed to power through class 5 tile, marble, porcelain, granite, slate and glass quickly and cost effectively.



The glass-and-tile bits from Vermont American have a spear-pointed carbide tip to reduce breakout.



Hitachi offers circular bits with diamond-grit cutting edges for drilling glass, tile, marble and more.

TECH TIP: ENLARGE OR "MOVE" A PRE-EXISTING HOLE IN FINE WOODWORKING

For enlarging or "moving" pre-existing holes up to 1 inch in diameter, one option is to plug the existing hole with a dowel and then re-drill it. Dowels are available in 1/8-inch increments. Select a dowel that fits snugly in the hole; you should find it necessary to tap it in using a plastic or rawhide mallet. If the hole does not fit one of the dowel's dimensional sizes, use a larger dowel and taper it to fit the hole using sandpaper. Next, select a good-quality bit with a starting point and side cutters, such as a Forstner or brad point bit, which drill more precise holes than standard twist drill bits. Use a drill press and make sure the workpiece is clamped down to prevent wobble and inaccurate drilling. Drill the hole to your desired depth.

—courtesy Vermont American, www.vermontamerican.com

To use freehand, position the bit at an angle to pilot the hole. Slowly begin the edge of the hole and gradually center the bit directly above, drilling down eliminating the risk of drill bit wander. Use water spray to cool the cutting. As the bit drills down through material, the hollow barrel of the bit creates a core that helps guide the drill and eliminates skating.

Masonry Bits

Masonry bits are a variation of the twist-bit design and are typically used with a hammer drill for its high-impact action. They feature a chisel-like tungsten carbide tip to break up stone, brick or concrete, while the flutes pull back the chipped material. Because these bits occasionally get jammed with crushed masonry, it's best to operate the hammer drill with a pumping action. Masonry bits are excellent for installing wiring and plumbing in existing structures.

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Shop Smart

Obviously, there are tons of drill bits purpose-built for a multitude of different jobs, so avoid the one-type-fits-all mentality. Also consider the construction of the bits—aspects such as a hex shank can offer better grip in the chuck. And, don't overlook the accessories. While many bits are sold as stand-alone items, many bit sets are sold in carrying cases that vary greatly in quality. You'll appreciate a well-constructed case and curse a lousy one, when you're constantly collecting your spilt bits.

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Masonry bits feature a chisel-like tungsten carbide tip and are often used with a pumping action to pull chipped material out of the hole.

SOURCES:

Bosch Power Tools
www.boschtools.com

Century Drill & Tool
www.centurydrill.com

Festool
www.festoolusa.com

Hitachi Power Tools
www.hitachipowertools.com

Lee Valley Tools
www.leevalley.com

Milwaukee Electric Tool
www.milwaukeetool.com

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By Matt Weber

Smart New Features in Bosch Table Saw

Here's a look at a great table saw that was made even better.

Over the past couple of years my go-to table saw has been the 15-amp Bosch 4000 series. This sweet saw has a lot going for it. For starters, I love the soft-start feature, which smoothly brings the 10-inch blade up to cutting speed. The motor also offers Constant Response Circuitry, which maintains blade speed under load, so the saw adjusts to the cutting task at hand. The table has a nice, spacious surface, a solid rip fence and miter gauge, and the whole thing is portable. The saw's Gravity Rise table-saw stand relies on the weight and balance of the saw to convert from working position to a cart-like transport position with practically no effort. The 8-inch pneumatic tires make wheeling the saw from site to site an easy task. I tackle many more on-site projects than "workshop" jobs, so portability was critical. The Bosch 4000 quickly became one of my favorite tools, and I really had no complaints at all. Then Bosch went and improved upon the design for the company's new 4100 series. And I jumped at the chance to test it.

A new blade-guard system and a digital rip fence set the Bosch 4100 apart from the pack.

Digital Rip Fence

The 4100 series starts with a great platform—that being the 4000 series—and adds some really handy features. Nothing from the 4000 series is missing, only enhanced with some special accessories such as a digital rip fence. Combining accuracy with easy readability, the digital fence provides a high-visibility LCD gauge and display that magnetically attaches to the sturdy SquareLock rip fence. The die-cast aluminum digital fence provides readouts in increments of 1/8, 1/16 and 1/32 inch, as well as metric within 0.5 millimeter.

Here's how it works: Lift the blade guard and anti-kickback pawls covering the blade. Align the rip fence flush with the blade. Turn on the digital display and press "Reset." This sets the rip fence to zero. Now slide the fence away from the blade and it calculates the distance moved,

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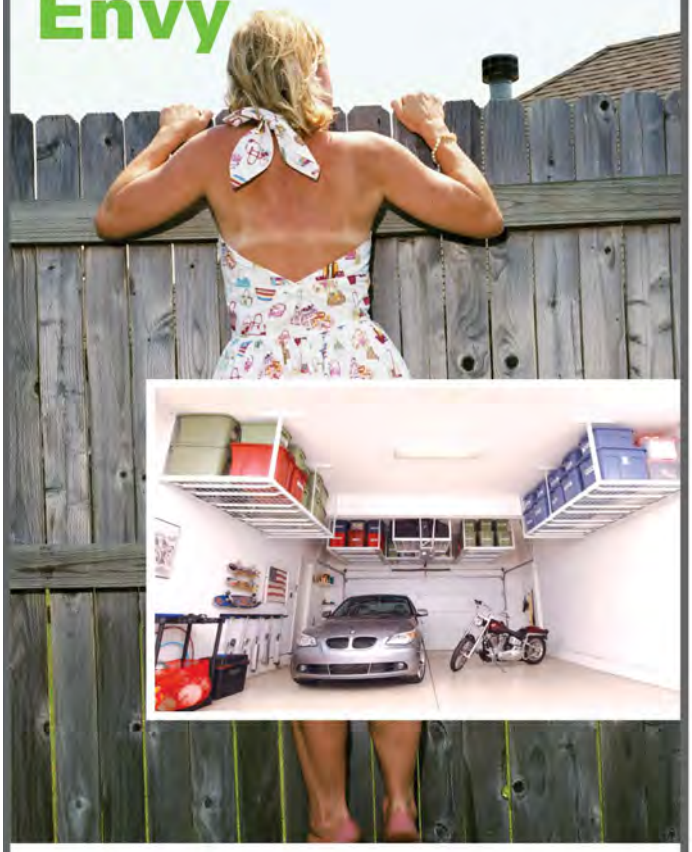

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Simply the strongest

The digital rip fence quickly makes measurements that are easy to read.

The Smart Guard System utilizes two blade-guard "arms" that move independently.

displaying on the LCD screen. Simply find your measurement and lock the rip fence in place for cutting. It's a great tool for speeding up the ripping process.

Smart Guard System

The Smart Guard System is comprised of a blade guard, riving knife and anti-kickback pawls. One of my favorite aspects of this new guard design is that each component is modular and tool-free. This makes it quick and easy to attach or remove components for various cutting applications, with no need for those pesky hex keys.

The blade guard actually consists of two separate "arms," which move independently. If your cut isn't wide enough to raise both blade guards, then the other arm stays down, providing maximum protection from the blade. You can also look between the two arms for an unimpeded line of sight to the blade. Plus, each arm of the guard locks in place when lifted out of the way—a handy feature when accessing the blade with the guard still in place.

Pros are pioneers every day.

Admittendly, we are a little proud that we were the first to revolutionize measuring technology with laser precision more than 15 years ago. Our customers throughout the world know that whatever the challenge, they can rely on the Swiss pioneering spirit of Leica Geosystems. Today, the members of our product families are still among the first on every building site between the North Pole and South Pole. There they make their valuable contribution when architects translate visionary plans into reality or civil engineers realize impressive static solutions. Because a pro is a pioneer every day.

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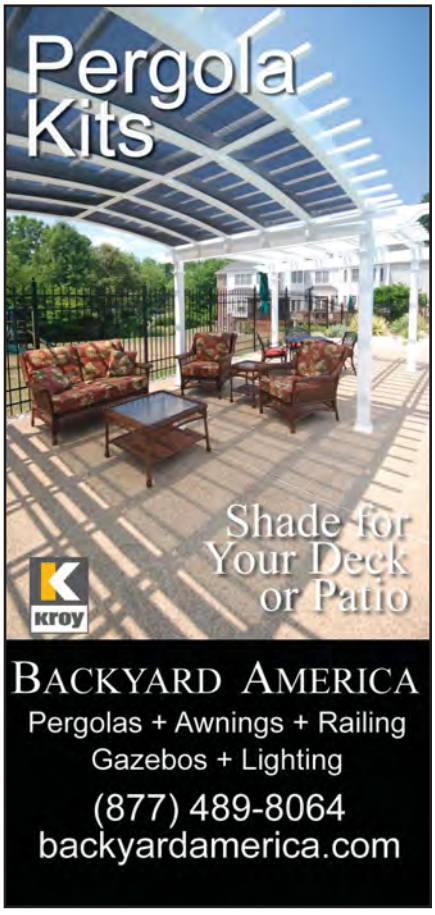
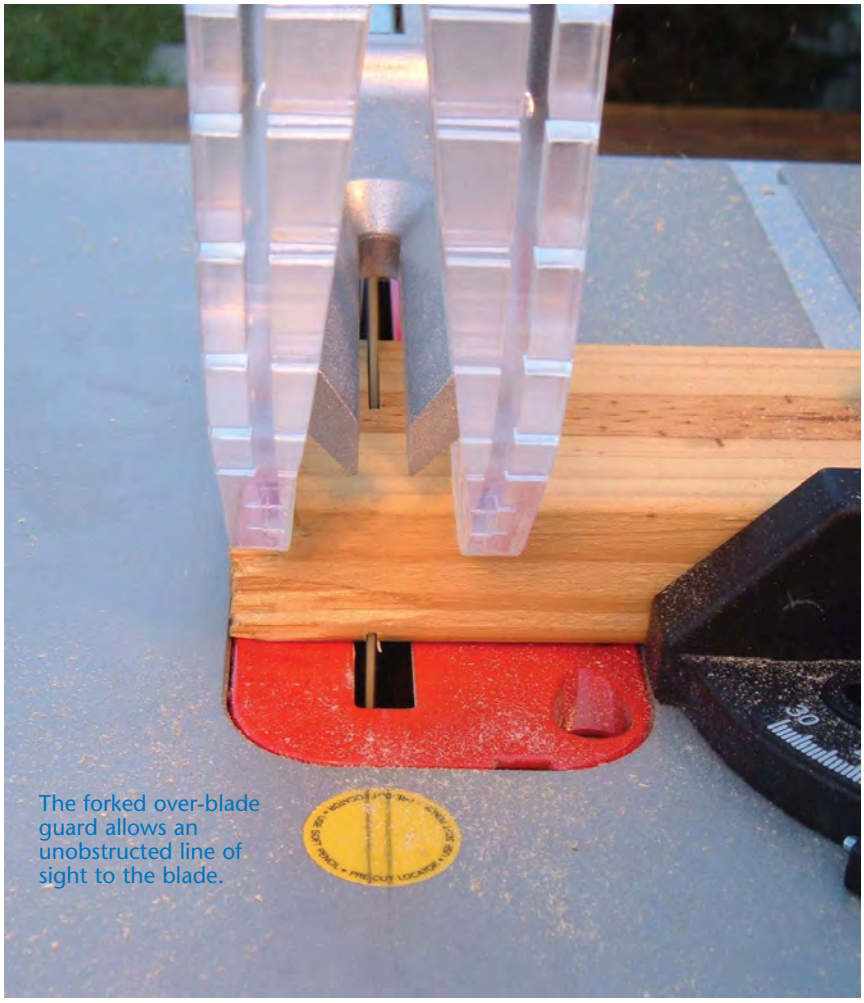
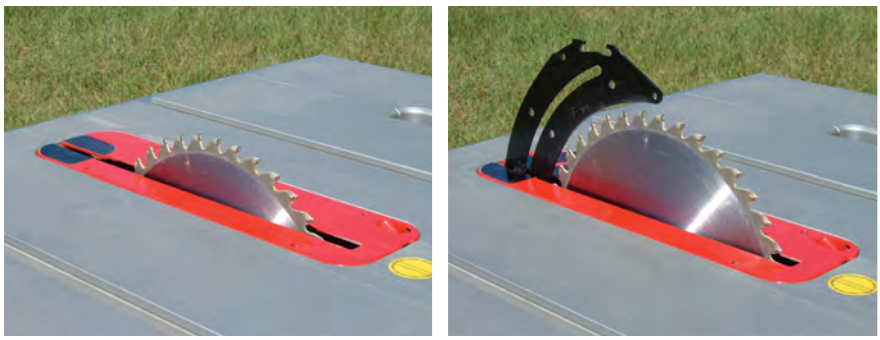




The forked over-blade guard allows an unobstructed line of sight to the blade.

The three-position riving knife is also easy to adjust without the use of tools. In its full upright position, it functions as a standard riving knife. Its middle position lets the riving knife function as a splitter for thicker pieces (without the guard or kickback pawls). Or, it can recede below the table for "non-through" cuts, such as re-sawing lumber.

And to top it off, both the blade guard and anti-kickback pawls can be stored on the side of the saw (along with the rip gauge and miter gauge). I found the on-tool storage to be an especially nice amenity when transporting the saw; it prevents the guard from rattling around so much when wheeling it over rough terrain.



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Heavy Duty HD™

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The on-tool storage for accessories keeps everything self-contained and organized.

The table top extends for greater cutting capacity.

Enhancements

In addition to the new guard system and digital readout, the Squarelock rip fence of the 4100 features a thicker, beefier design than the 4000 series, as well as a new T-slot miter gauge, which holds the accessory firmly in place during use. The tabletop features a 29-by-21-1/2-inch work surface, and the table extends for a 25-inch rip capacity. Plus, the dust-collection system has been improved. The 4100 Series is aces in my book, and I couldn't ask for more in the way of features. Of course, if the engineers at Bosch think they can trump this new model, then I look forward to seeing what they come up with next.

By the way, if you're as impressed with Bosch's Gravity Rise stand as I am, then check into the Gravity Rise T4B Portable Miter Saw Stand. It boasts a similar design for quick setup and breakdown but includes support rails that extend to 16 feet of material support, complete with stops for repetitive cutting and universal mounts for a wide range of manufacturers' miter saws.

For more information, visit www.boschtools.com or call 1-877-BOSCH99.

The Bosch 4100 offers a 25" rip capacity.

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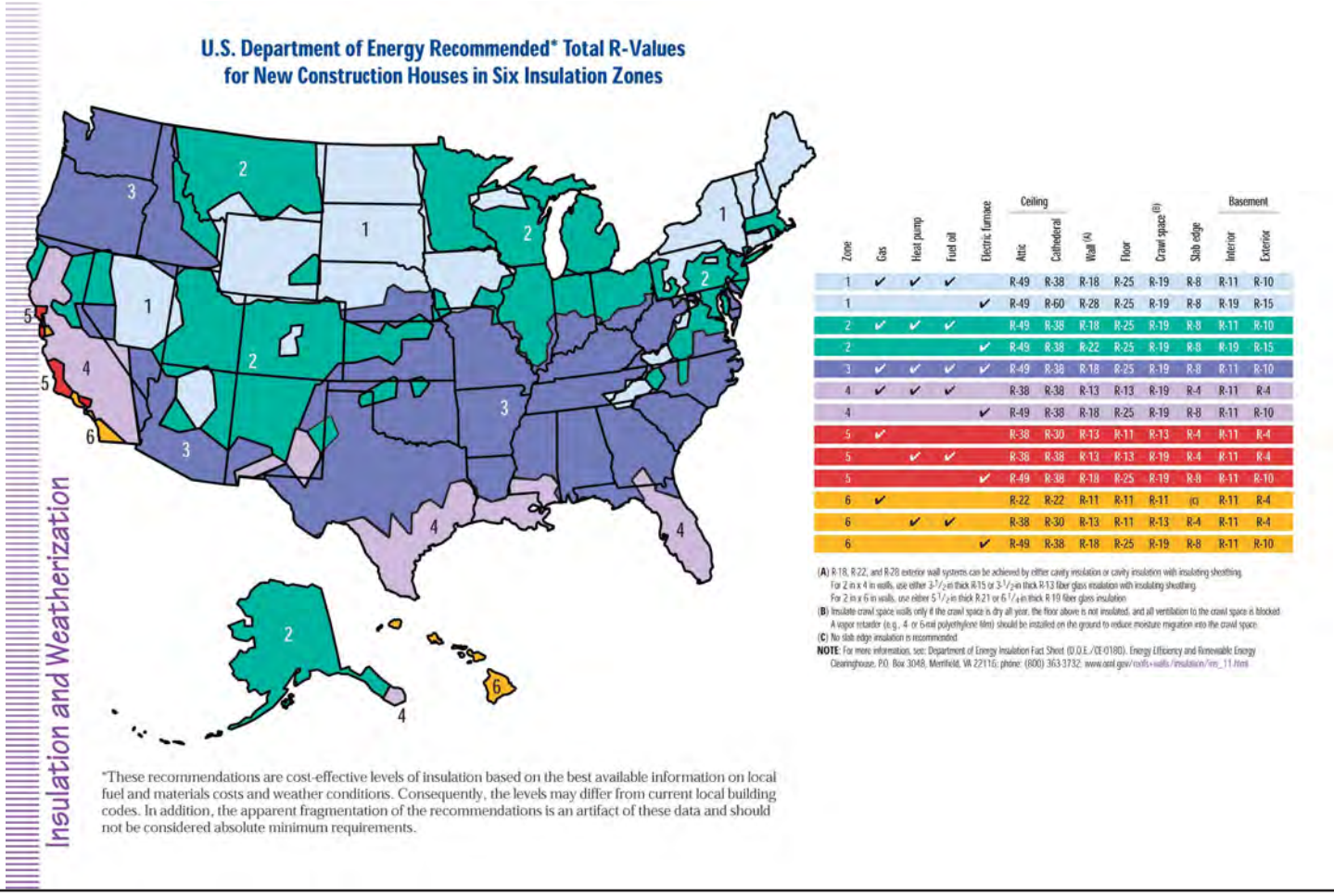
All About Insu

lation

By Monte Burch

A wide range of products helps to keep your home comfortable and cuts down on energy costs.

Insulation has come a long way from the mud and grass "chinking" and crack fillers of our early ancestors. These days a wide range of insulation products and applications are available to totally envelope and insulate a building. Why insulate? The main reasons are obvious—keep out the cold or the heat, provide energy savings and, of course, lower energy usage and bills. Insulation also provides a more comfortable home because a more constant temperature is maintained. Insulation absorbs sound, reducing the noise from appliances, conversation, radio, television and other audio sources through walls. Insulation can also provide a healthier home as it retards the growth of potentially hazardous mildew and mold in your ceilings and walls caused by trapped moisture. And modern advances in products such as Johns Manville Fiberglass Insulation go one step further, promoting better air quality because the material is Formaldehyde-free.



Zone	Gas	Heat pump	Fuel oil	Electric furnace	Ceiling: Attic	Ceiling: Cathedral	Wall (A)	Floor	Crawl space (B)	Slab edge	Basement: Interior	Basement: Exterior
1	✔	✔	✔		R-49	R-38	R-18	R-25	R-19	R-8	R-11	R-10
1				✔	R-49	R-60	R-28	R-25	R-19	R-8	R-19	R-15
2	✔	✔	✔		R-49	R-38	R-18	R-25	R-19	R-8	R-11	R-10
2				✔	R-49	R-38	R-22	R-25	R-19	R-8	R-19	R-15
3	✔	✔	✔	✔	R-49	R-38	R-18	R-25	R-19	R-8	R-11	R-10
4	✔	✔	✔		R-38	R-38	R-13	R-13	R-19	R-4	R-11	R-4
4				✔	R-49	R-38	R-18	R-25	R-19	R-8	R-11	R-10
5	✔				R-38	R-30	R-13	R-11	R-13	R-4	R-11	R-4
5		✔	✔		R-38	R-38	R-13	R-13	R-19	R-4	R-11	R-4
5				✔	R-49	R-38	R-18	R-25	R-19	R-8	R-11	R-10
6	✔				R-22	R-22	R-11	R-11	R-11	(C)	R-11	R-4
6		✔	✔		R-38	R-30	R-13	R-11	R-13	R-4	R-11	R-4
6				✔	R-49	R-38	R-18	R-25	R-19	R-8	R-11	R-10

(A) R-18, R-22, and R-28 exterior wall systems can be achieved by either cavity insulation or cavity insulation with insulating sheathing.
For 2 in x 4 in walls, use either 3-1/2-in thick R-15 or 3-1/2-in thick R-13 fiber glass insulation with insulating sheathing.
For 2 in x 6 in walls, use either 5-1/2-in thick R-21 or 6-1/4-in thick R-19 fiber glass insulation.
(B) Insulate crawl space walls only if the crawl space is dry all year, the floor above is not insulated, and all ventilation to the crawl space is blocked.
A vapor retarder (e.g., 4 or 6-mil polyethylene film) should be installed on the ground to reduce moisture migration into the crawl space.
(C) No slab edge insulation is recommended.
NOTE: For more information, see: Department of Energy Insulation Fact Sheet (D.O.E./CE-0180). Energy Efficiency and Renewable Energy Clearinghouse, P.O. Box 3048, Merrifield, VA 22116; phone: (800) 363-3732; www.eere.gov/roofs+walls/insulation/fm_11.html

*These recommendations are cost-effective levels of insulation based on the best available information on local fuel and materials costs and weather conditions. Consequently, the levels may differ from current local building codes. In addition, the apparent fragmentation of the recommendations is an artifact of these data and should not be considered absolute minimum requirements.

It's important to understand the R-value in your locale. Zone maps and charts like the one shown from Johns Manville are available to help you determine the needed R-value for your area.

Heat, a form of energy, always moves from higher to lower temperatures. In the hot summer, heat moves to the cooler indoors. In the cold winter, heat moves to the colder outdoors, transmitted through walls, ceilings and roofs. Insulation creates a thermal barrier that provides resistance to this movement. It's simple—the more you insulate, the more you save in energy, provide a more comfortable home and add to the life of your house.

Most homes consist of conditioned or heated areas and unheated areas such as a garage, crawlspace and attic. All exterior walls that separate conditioned and unconditioned spaces should be insulated to create a thermal envelope around heated areas and provide a boundary between the heated and unheated spaces. This also includes knee walls that open up into attics or garages. For a total thermal barrier you should also insulate basement floors, walls, slabs, crawlspaces, attics and cathedral ceilings. Interior walls and floors can be insulated for sound control.

Total Insulating System

These days, products are designed for each specific use. For the most energy-efficiency, a combination of products can be used, creating a total insulating system. The Owens Corning Insulation System consists of many products, all working together throughout the building to deliver year-round energy savings and comfort. This includes products for insulating the foundation walls, crawlspace (underfloor), heated crawlspace, under a slab, basement walls, floors, heating and cooling HVAC ducts, exterior walls, interior walls, finished or unfinished attics, and cathedral ceilings. The system reduces heating and cooling costs, reduces air infiltration and controls moisture.

Normal, everyday living can put from 5 to 10 pounds of moisture into the home each day. In the winter months this moisture can accumulate and condense on the cold inner sides of exterior surfaces. This can cause paint to blister, form stains on drywall ceilings and walls, even damage the building's structure. Vapor barriers can help control the amount of moisture passing through insulation and collecting inside exterior walls, ceilings and floors.

First Things First

The first step in insulation begins with house construction, utilizing insulation-board sheathing where code rules allow and are applicable. For example, TechShield sheathing from Louisiana-Pacific is made of a thin, durable sheet of aluminum overlay laminated to OSB. The overlay serves as a radiant barrier that minimizes heat gain and loss. The TechShield sheathing

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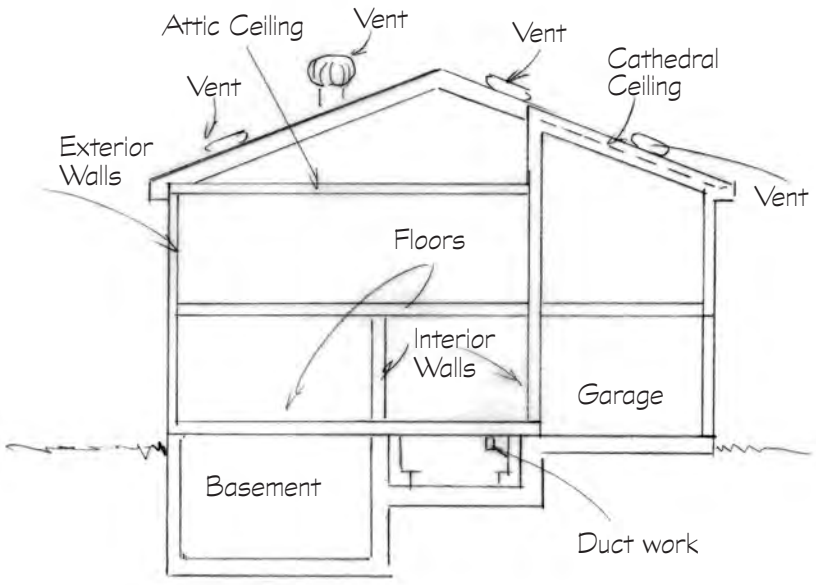


The strategy these days is to create a thermal barrier to totally envelop the house, separating unheated areas from conditioned areas.

panels also have channels that allow trapped moisture to escape without affecting radiant-barrier performance.

In addition, for new house construction, or when residing, a house-wrap vapor barrier should be used. Dupont Tyvek DrainWrap is an excellent choice, as it offers a unique combination of a weather-resistant barrier with a drainage system. The vertical grooves help drain away water quickly, yet the product has a breathable structure that allows moisture to pass through for quicker drying of walls, thus preventing mildew and mold. All cracks and openings around doors and windows, and where piping or wires enter the house, should be well caulked with DAP SIDE Winder Siding and Window Sealant and/or sealed with foam sealants such as Dow Great Stuff Window and Door Insulation.

Insulation is available in a wide range of products, some do-it-yourself, some dealer-installed. All insulation products are based on R-values or thermal resistance. Products with higher R-values provide more insulation. Different portions of the country have different R-value needs. The first step is to determine the recommended R-value by the U.S. Department of Energy for your region. Or, check with your local building supplier as to the R-values needed for your home and area. You can also check out the companies mentioned in this article for specific info on the R-values of their different products.

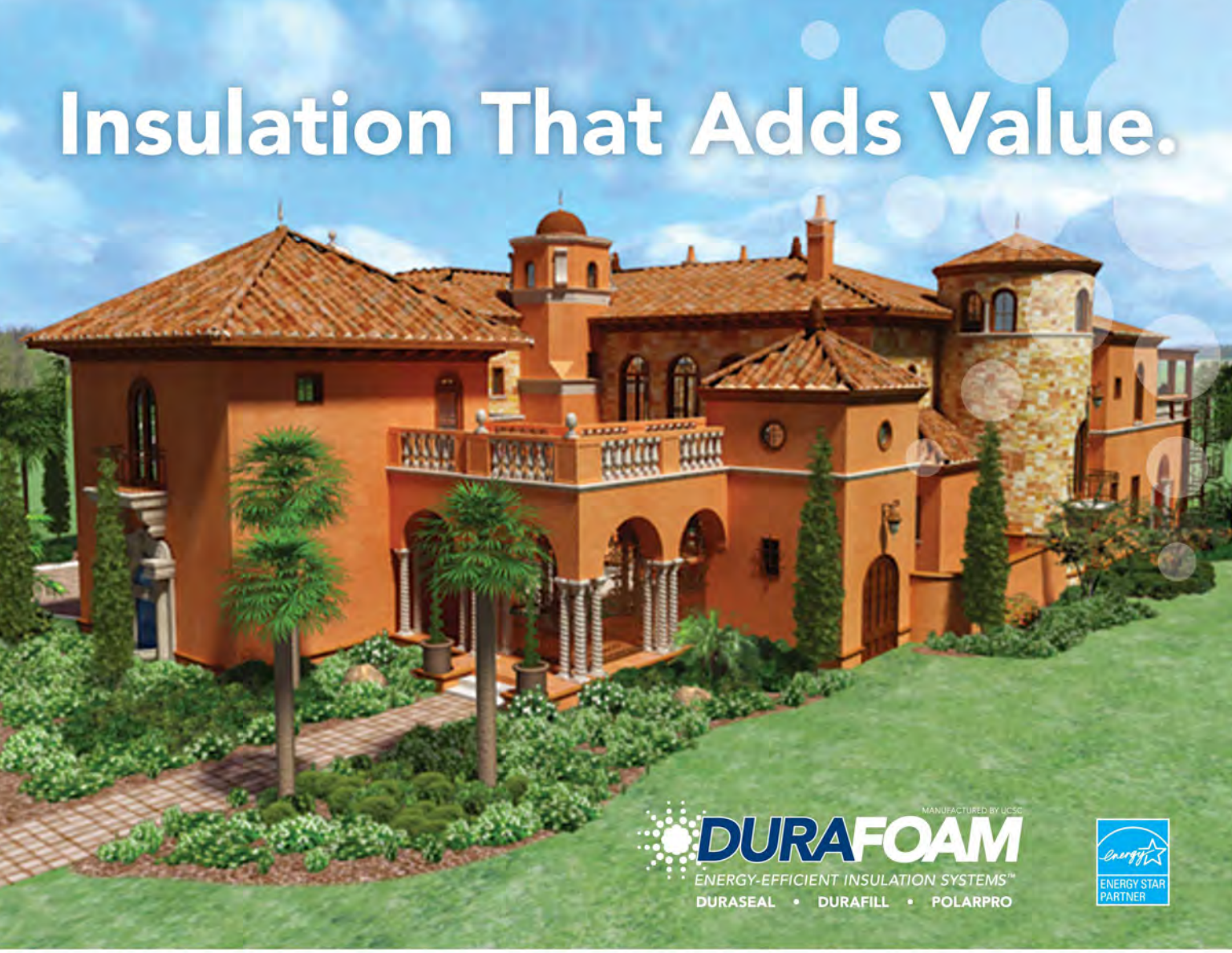
The most commonly used do-it-yourself products are the fiberglass batts or rolls. Rolls are long, continuous lengths of insulation rolled up that are measured and cut to fit specific areas. They're best for insulating long runs in crawl spaces and attics. Batts are pre-cut lengths available for 8- and 9-foot walls. They're fast and easy to install because they don't require cutting. In most instances of whole-house insulation, you'll need some of each.

Batts or rolls may come unfaced or faced. Some include a vapor barrier on one side and a Kraft paper wrap on the opposite. These are commonly used in crawlspaces. Foil-face or paper-faced batts or rolls have one side covered with those materials and both can be used in walls, attics and sidewalls. Unfaced fiberglass batts do not have a covering and are more economical, but don't provide moisture control. They are commonly used in unheated attics.

Installing batt insulation during new construction is a fairly easy do-it-yourself project. The first step is purchasing the correct insulation. The walls may be framed with 2-by-4 or 2-by-6 studs. Two-by-6 studs allow for more insulation because of their extra depth. Depending on local codes or the desired R-value for the wall, Owens Corning suggests using 5-1/2-inch thick R-21. The choices for 2-by-4 stud walls are R-15 and R-13, both of which are 3-1/2 inches thick. For standard height walls, use pre-cut batts rather than continuous rolls. Each piece of insulation is manufactured to the size of the typical stud framing, which is usually built on 16 or 24 inches on center, and about 92 inches high. These cut-to-size batts make the job go faster and easier. The insulation should fit snugly against the studs and completely fill the cavity to the top and bottom plates. Cut batt insulation to fit snugly around obstructions, such as electrical boxes, plumbing and plumbing vent lines. When using Kraft-faced batts with flanges, staple the flanges every 8 to 12 inches. The flanges can be stapled to the front or inside of the stud. Drywall installers prefer the face to be stapled on the inside of the studs. Owens Corning FastBatt insulation does not have stapling flanges.

Insulated building products used in construction is the first step. (photo courtesy Louisiana-Pacific)

Insulation That Adds Value.



Utilizing the Durafoam Insulation System, the Stellar Golf House is a model of energy efficiency and occupant comfort.

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Vapor barriers are also extremely important, both inside and outside. House wraps are the next step in insulation. (Photo courtesy DuPont)

Note: Never leave faced insulation exposed. The facings on Kraft-and-foil insulation will burn and must be installed with substantial contact with an approved ceiling, wall or construction material to help prevent the spread of fire in the wall, ceiling or floor cavities. Unfaced fiberglass is non-combustible.

Addressing the Attic

Properly insulating an attic is extremely important. In case the attic is unfinished, lay walk boards across the joists and provide a temporary light. Batt, roll or loose-fill insulation can be used to fill the voids between the ceiling joists. The attic insulation does not have to be fastened in place as gravity will keep it down. If the batts have a vapor barrier, it should be placed face-down toward the heated rooms below. Leave the batts or rolls in the package wrapper until you get the package into the attic. When you open the package the batts will expand a great deal. Place the batts or cut the rolls to fit down between the ceiling joists, leaving a bit of space at the outer walls for air flow. Make all the long runs first and then cut the shorter pieces. Where pieces are joined, butt them together tightly and tape the vapor barrier joints with foil-faced construction tape. Carefully fit around electrical wiring, making sure you don't disturb or loosen the wiring. All insulation must be kept at least three-inches away from recessed light fixtures unless they are indicated with a mark (IC) or Insulated Ceiling. Fill any spaces between the chimney and wood framing with noncombustible insulating materials such as batts without facings. Insulation should also not be placed directly around a flue, but again leaving at least 3 inches all around the flue. You will not need insulation installed between the rafters, if the ceiling is insulated. The exception is in cathedral ceilings and in some cases of attics that are finished off with knee walls.

All cracks around windows and doors must be properly sealed with caulk or expanding foam.

Working with Fiberglass Insulation

Fiberglass insulation consists of tiny strands of fiberglass, and some of the particles will come off and drift

Fiberglass batt or roll insulation is the most commonly used product. It can be used in both interior and exterior walls, attics and crawlspaces. Photo courtesy Johns Manville

Install soffit stops (shown right) to create air flow between the attic and soffits.

Do not unroll or remove the insulation from the package until you get into the attic. (Photos courtesy Owens Corning)

through the air as the material is installed. This can cause a serious irritation. Many years ago I worked as a laborer for a construction company building commercial buildings. We constructed a low-roofed, long motel, and one of my jobs was to insulate the attic portion. The batts had to be pulled some distance through the attic and installation was tight. I ended up with serious irritation under my arms and knees that required a doctor's visit. Always wear long pants and a long-sleeve shirt that can be fastened tightly at the wrists and collar. A plastic rain coat, or these days a Tyvek overall, is the best bet. Wear safety glasses, gloves, a tight-fitting cap and a respirator. Work for only 10 to 15 minutes at a time, and then get back out into the fresh air for a few minutes.

Rigid Foam Sheathing

Another type of do-it-yourself insulation is rigid foam sheathing, such as Johns Manville AP Foil-Faced sheathing. Made of polyisocyanurate foam, it provides R values up to 22.8. Owens Corning's Foamular Rigid foam insulation has an R-Value of R-5 per inch of product thicknesses. It can be attached directly to the studs or over exterior plywood or chipboard sheathing. To achieve an R-19 wall system, add the Foamular RL-5, plus a 2-by-4 wall cavity filled with R-13 fiberglass insulation. Exterior siding and drywall typically add an R-value of R-1. Taking it one step further, you can side with insulated vinyl siding. Mitten Vinyl Siding InsulPlank foam-backed siding is made with a tough polymer exterior and "true flat" design that lays straight, laps tight and never needs painting. The foam backing also increases the R value.

Apply the rigid foam vertically (parallel to the studs), attaching to studs with collar-head nails. These are nails with large plastic washers already attached to the nails. Nail length must be sufficient so the nails penetrate studs by 1 inch. Space nails every 8 inches on each stud covered. The material is easily cut to fit around windows and doors and other construction obstacles, but measure carefully to avoid leaving uninsulated spaces. Once the installation is complete, seal all joints with Owens Corning Bil-R-Tape construction tape to prevent air infiltration. Note: since Foamular is a non-structural material, it must be installed over adequately braced framing in accordance with local building codes.

Owens Corning Foamular insulation may also be added to your basement walls, foundation walls, even under a slab. Before insulating a basement or foundation, check for water leakage and fix any problems. All leaks should be sealed on the exterior surface. The band joists should be caulked and sealed to prevent air infiltration at the construction joints and around all penetrations such as plumbing, electrical and HVAC and dryer vents. Three different methods can be used. (1) You can construct stud frames at the interior of the foundation walls and fill the cavities with fiberglass insulation. (2) You can install Owens Corning Insulpink foam insulation board or Basement Blanket. Or, (3) you can use the Owens Corning Basement Finishing System, which requires no additional paneling or drywall.

Another area that should have insulation in a crawlspace is the duct work. Cover these with Johns Manville Duct Wrap.

Blown-in Insulation

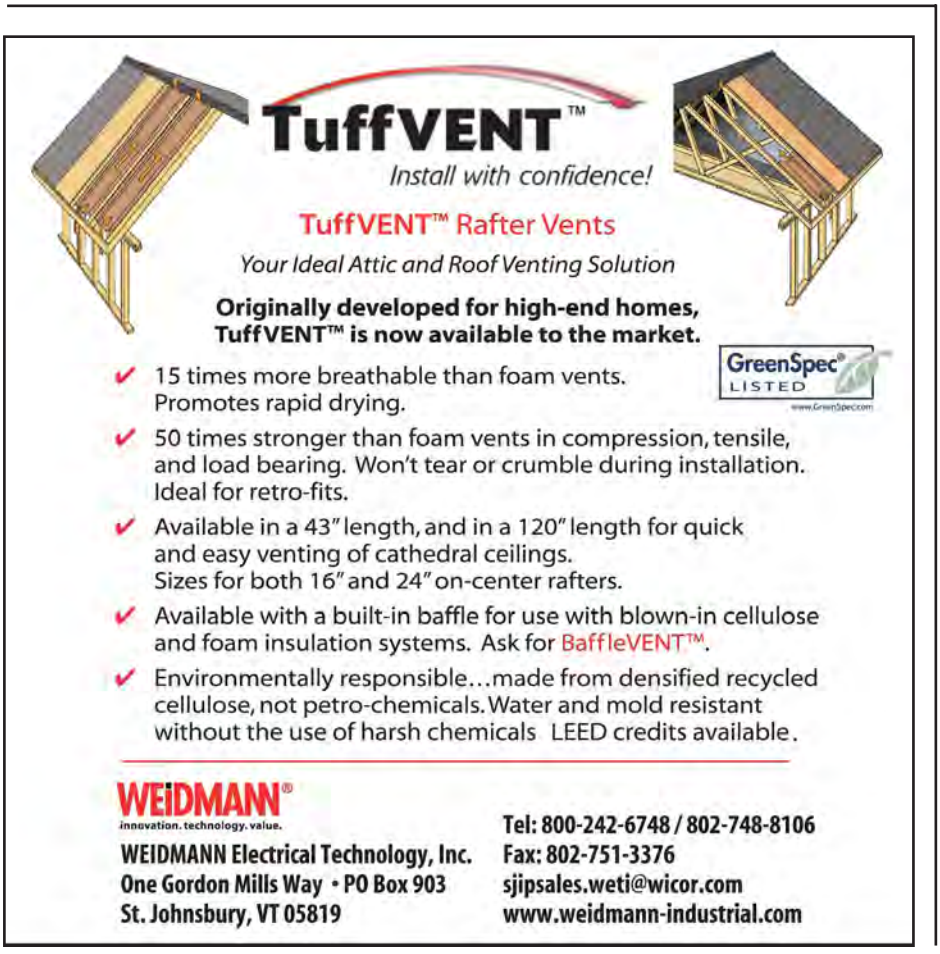
Another type of insulation is loose or blown-in, which has several benefits—the major one being complete uniform coverage, even in hard-to-reach areas. This can be a dealer or do-it-yourself installation. You can rent machines to blow in the insulation from building suppliers such as Lowe's. Cocoon Blow-In Attic insulation costs less than other types, is itch-free and easy to apply. Cocoon settles into voids and gaps, producing a monolithic, blanket-like thermal barrier. There is no cutting, stuffing or fitting. Simply place the machine outside and haul the hose into your attic. This is a two-person job, with one person in the attic applying the insulation and a second person outside feeding the Cocoon materials into the machine.

Stuff unfaced insulation between chimney and wood framing, but not in contact with flue.

Make sure there is a barrier and at least a 3-inch space around recessed lights and other heat sources. (Photos courtesy Owens Corning)

In the attic, locate any recessed lights, furnace flues, heating vents, chimneys and other sources of heat, and install barriers around heat sources with clearances of at least 3 inches from the heat source. Heat trapped by any type of insulation can be a fire hazard. Determine the desired installed thickness of the insulation and mark the rafters as a guideline to be used during application. Create a barrier around the attic access hole. Soffit baffles should be used in soffits and proper ventilation provided in the eaves. Outside, turn on the machine and feed the bags of Cocoon material into the machine. Inside the attic, begin in the corner furthest from the attic access and work back. Be careful to step on top of and not between the ceiling joists. Fill to the correct thickness for your required R-value.

A number of companies, including Certainteed and Block The Heat, offer dealer-installed, blown-in insulation. According to the folks at Block The Heat, if you can see the tops of your ceiling joists inside the attic, you probably don't have enough attic insulation. You probably only have about 5 inches of insulation. You should add insulation to increase the level to 10 to 15 inches. The company installs both fiberglass and cellulose insulation. Current building codes suggest an R-value of 38 to 49, depending on whether you have gas or electric heat. This is basically 15 to 18 inches of blown fiberglass or 10 to 12 inches of blown cellulose.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Reflective radiant barriers can also add to insulation efficiency. Horizon Energy Systems Thermal Control Membrane consists of three layers of double-sided membrane with a patented separation system that has been proven to outperform all other reflective insulation products. It can be used in attics, wall systems (behind the wallboard with taped seams in cold climates like a vapor barrier), or just roll out over your attic insulation (in

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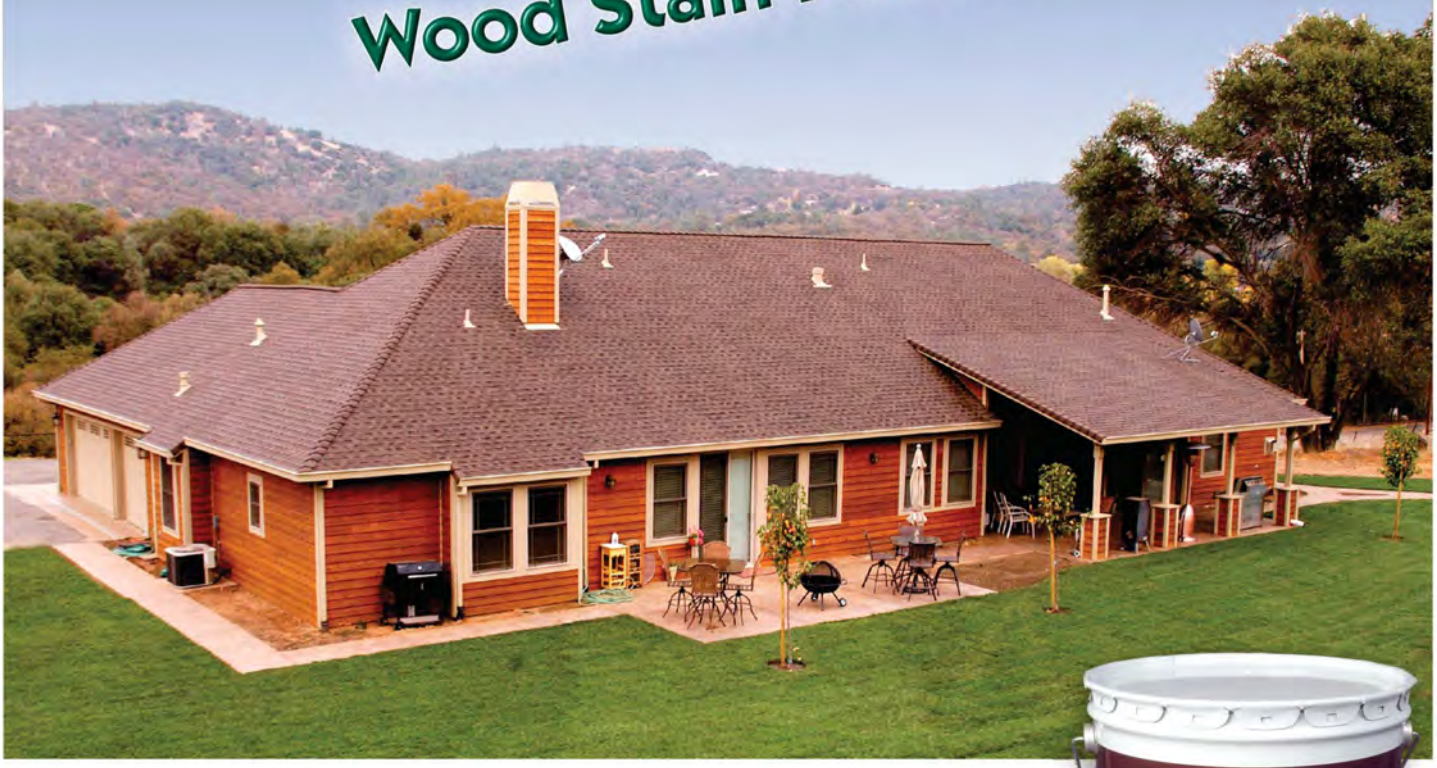

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Expanded foam insulation boards can also be used to insulate basement walls, foundations and other areas. (Photo courtesy Owens Corning)

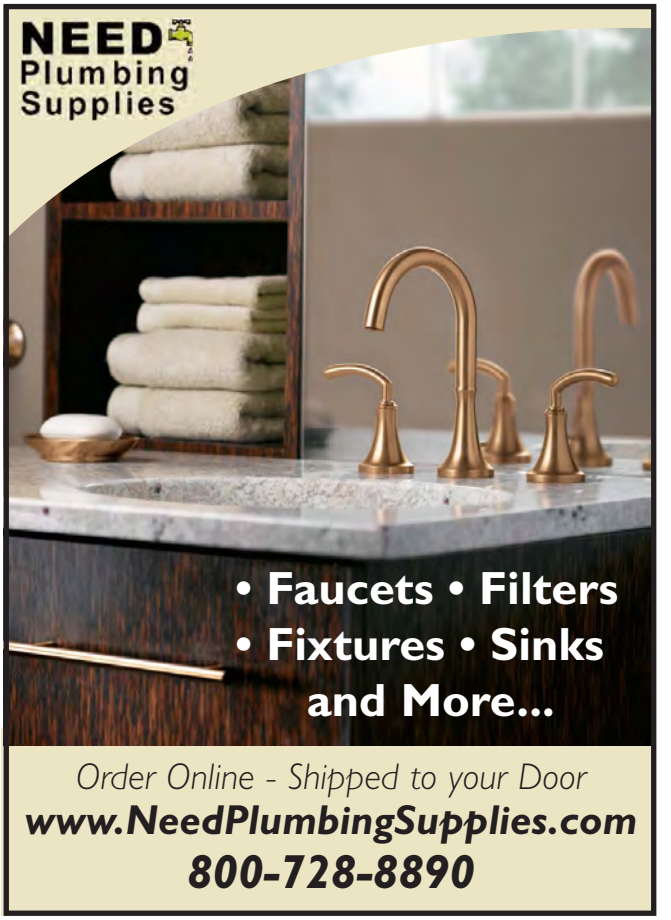
warm climates). New homes wrapped with TCM and have it in the attic must reduce the capacity of the HVAC systems by at least 40 percent.

Block The Heat has both a Radiant Barrier Spray and a Radiant Barrier Foil. The spray reflects about 75 percent of the heat and the foil about 97 percent. Foil is the best radiant barrier and the most cost-effective. However, in many attics, installing foil can be very difficult. And, paying someone to install foil can get expensive ($.75 to $2.00) per foot. The company's Spray-On Radiant Heat Barrier is essentially a "liquid foil" that is only available through commercial contractors.

Spray Foam Insulation

Spray-in-place, expanding foam insulation has become increasingly popular in new construction. It installs fast and seals, soundproofs and insulates. Most products are dealer-installed. Icynene spray formula is a 1/2- pound, density-free rise, open-celled material supplied by independent Icynene licensed dealers. It is an effective "breathing" air barrier that can adjust with the building. Convective air movement inside cavities is virtually eliminated, providing more uniform temperatures throughout the building. Icynene is applied by spraying liquid components onto an open wall, crawlspace or ceiling surface. There the liquid expands 100:1 in just seconds to provide a flexible foam blanket of millions of tiny air cells, filling building cavities and sealing cracks and crevices. Excess material is easily trimmed off, leaving a surface ready for drywall or other finish.

For those interested in "green building", BioBased Insulation is also a spray-in-place insulation made from soybean oil, an annually renewable resource, replacing petroleum ingredients. BioBased Insulation is a thermo set plastic foam that is by its nature inert. BioBased Insulation



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will not support mold growth and is not a food source for rodents, insects or vermin. BioBased Insulation is custom applied into place, disallowing it to sag or settle over time like conventional insulation.

For the DIY homeowner, Tiger Foam Insulation Kits come complete with gun and hose assembly, extra nozzle tips, and require no outside power source or additional machinery to apply. These portable and disposable foam insulation kits are easy to use, even for first timers. Tiger Foam Insulation is a quick-curing, disposable, two-component foam manufactured using environmentally-friendly blowing agents and fire-retardant chemicals. It does not contain CFCs, VOCs, Formaldehyde or PENTA-BDEs. It's available in two formulas—Fast Rise E-84 Fire-Rated Surface Spray and a Slow Rise, Low-Pressure Cavity Fill formula.

Ventilation is Key

Along with proper insulation it's also important to provide proper ventilation. Ventilating creates a positive air flow that allows the house to breathe and prevents the build-up of moisture. The attic should have eave vents along with gable and/or roof vents. At least two vents are required to create an air flow—in one and out the other. Owens Corning suggests 1 square foot of free vent area per 300 square feet of attic floor when a vapor retarder is used. In situations where no vapor retarder is used, 1 square foot of free vent area should be provided for each 150 square feet of attic floor area. You will also need at least two crawlspace vents to create a positive air flow. One square foot of free vent area is recommended for every 1,500 square feet of floor area covered with a polyethylene vapor retarder (every 150 square feet if there is no vapor retarder). In crawlspaces that are unheated and/or have a dirt floor, it is also recommended the floor be covered with a polyethylene vapor retarder. All vents should be screened to keep out insects.

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Extreme How-To *explores the various systems and benefits of radiant heat.*

Warming Up with RADIANT HEAT

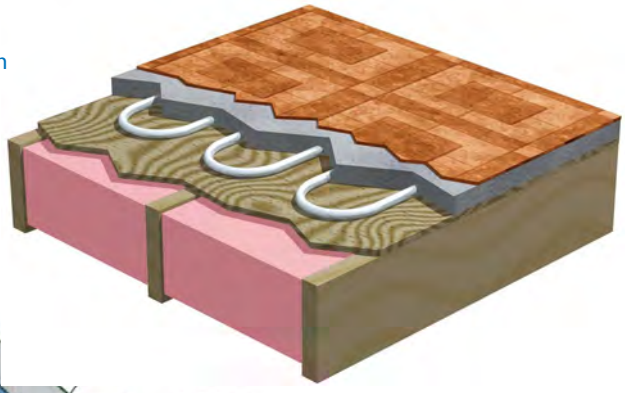
By Liz Koch and Matt Weber

The 3 AM tip-toed scamper to the bathroom can be avoided! Not with a prescription, but with the increased comfort of warm, radiant-heated floors. The concept of radiant heat has been around since the Ancient Romans, but allowing heat to rise naturally to create even warmth in a room is finally starting to gain in popularity for today's homeowners. Instead of conventional heating systems where a radiator sits against a wall creating pockets of hot and cold air throughout the room, this highly energy-efficient system heats your floors, which then transfers heat evenly throughout the rest of the room.

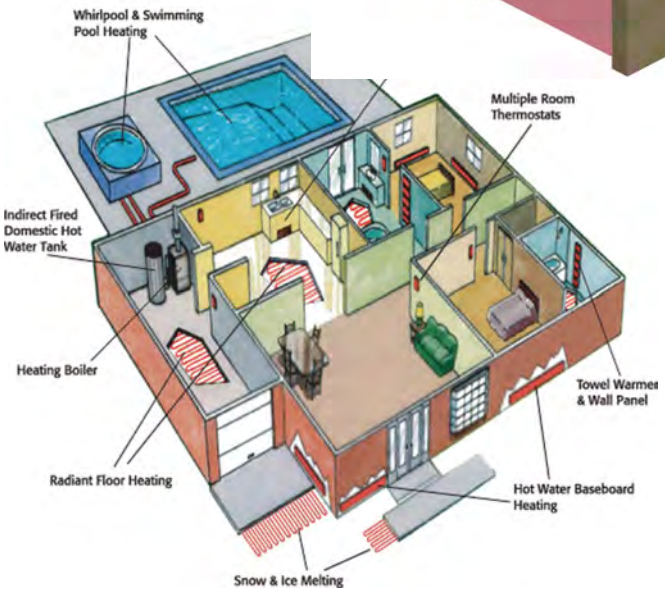
Comfort level is also greatly increased with radiant heat. In addition to solving the problem of cold tiles, the objects in the room (couches, chairs, etc.) will be heated via the floors, allowing the average temperature of the room to be lower while maintaining a higher level of comfort for the people in it. This allows homeowners to save big on their heating bills. Other benefits of radiant heat include the absence of both visible components and noise output from the system. There are several methods of installing radiant heat, and the method that you choose will depend heavily on the design of the house and rooms in which you want to add radiant heat.

Hydronic Radiant Heating

If you're installing radiant heat during the construction process, the most efficient way to heat your home is through a hydronic in-slab radiant heat system. For this method, you will need to design a loop system of tubing to circulate hot water under the floors. Depending on the width of the tubing, the loops will vary in recommended length. The most commonly used tubing size is 1/2 inch, which cannot have loops longer than 300 feet. Each loop is connected securely to a manifold and when the system turns on, hot water is



An in-slab hydronic system is an efficient method of heating floors. Radiant systems can also be used for outdoor heating applications. (Photos courtesy Uponor)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pumped through the tubing. The water heats the concrete slab, and the heat emanates from the floors, rising into the rest of the room. When the room reaches the temperature set by your thermostat, the hot water will stop circulating, but the slab will remain warm and keep your room at the desired temperature for several hours before requiring more hot water to circulate.

What You Need for an In-Slab System

A Loop CAD Design. If it's your first time dabbling in radiant heat or you just want to be sure it's done right, you can get a loop CAD drawn by a Radiant Certified Designer, usually for under $100. This CAD (Computer Aided Design) maps out the installation of your tubing system. A loop CAD with a materials quote is $75 from PexSupply.com.

ThermaPEX Tubing. A hydronic system uses cross-linked polyethylene tubing with an oxygen barrier. It is flexible enough to bend easily and strong enough to be approved by all major plumbing and heating codes.

Manifold. The manifold is the hub of a radiant heating system, connecting to the supply and return lines with as many ports as you have loops of tubing. If more than 12 loops are in a system, multiple manifolds may be necessary.

Circulator Pump. The system requires a quality pump,

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from manufacturers such as Taco or Grundfos, to circulate the water throughout the system. If there won't be potable water involved, a cast iron pump is a cost-efficient way to get the job done.

Check Valve. This valve ensures that water can only flow one way through the system.

Mixing Valve. Boiler water cannot go directly into the hydronic radiant system, the water must be mixed with cold water, sending 180-degree F water to heat your floors.

Thermostat. The interface between you and your heating system, the thermostat will control when the heat is turned on and how long it stays on to achieve the desired temperature in the room.

Sensors. In-slab sensors will communicate to the thermostat the temperature of the slab, while floor sensors will communicate the surface temperature of your floors to prevent any gapping, cupping or warping due to excessive heat.

Expansion Tank. The expansion tank maintains proper pressure within the system.

Air Eliminator. This device removes all excess air from the system to ensure silence and a steady water flow during operation.

Above: The manifold is the hub of a hydronic system.

Left: Hydronic systems can also be installed beneath floor joists.

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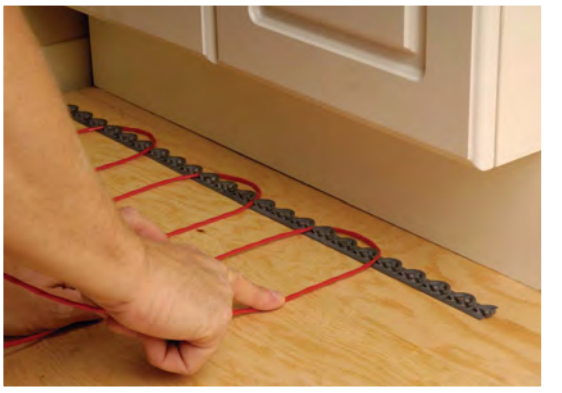

Electric radiant heat uitlizes thin underfloor mats (above) or a looped wiring system (right).

(Photos courtesy Step Warmfloor and NuHeat, respectively)

Joist Radiant Heating

Another option is to use hydronic radiant heat using the joists in the ceiling of one room to heat the room above it. Aluminum transfer plates are screwed to the underside of the subfloor, two across for the span of each joist bay. The tubing is then run and secured in the joists along the aluminum transfer plates. Once installed, be sure to thoroughly insulate between the joists with fiberglass batts to ensure you aren't losing heat as some radiates to the room below. Have a licensed electrician run wire from the room thermostat to the relay switch and then to the circulating pump. You'll need the same items listed above for slab installation as well as extra insulation, aluminum transfer plates and the 3/4-inch drywall screws to secure them in place.

Other Options for Hydronic Radiant Floors

If access to the slab or joists is not possible, there are still two options available to you for hydronic radiant heat installation. The first is an overpour where the tubing is placed on the subfloor and a minimum of 1-1/2-inch slab is poured on top. This will raise the floors by that amount, but the system works similarly to the slab installation where the tubing will heat the concrete, and the whole surface will maintain that warmth to radiate to the room above. The same components will be necessary for this method.

The second method is to use 1/2-inch plywood panels with pre-cut notches in which to fit the tubing. This is arguably the simplest installation method, since you place the tubing into pre-determined space, and it requires minimal change to the existing room.

(Editor's Note: Thanks to Liz Koch for contributing the above portion of this article.)

Electric Radiant Heating

A second type of radiant heat uses electrical cables embedded beneath tiles, marble, slate and in some cases laminates. Depending on the manufacturer, some electric systems can even be installed under carpet, and the heating elements function much like an electric blanket. The heated wiring can be installed in a looped system beneath the flooring, or installed in the form of prefabricated mats. The electric systems do not require poured slabs, which eliminates the mess of concrete when

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installing in finished houses. Plus, electric systems do not raise the height of the floor surface. This makes installation easier because it's not necessary to adjust doors, casings, room transitions, etc.

Often, electric radiant systems are sold in kits targeted for the DIY homeowner. Before installing any floor system, first create a layout plan to determine the materials required. Make notes of exact room measurements, placement and number of heating elements, length and wattage per element strip, location of power source and electrical boxes. Be sure the floor is prepared and clean. Most heating elements can be installed over any dry, clean, non-conductive and structurally sound surface. Thermal insulation is often installed with the heating elements. All electrical systems come with detailed installation

SAVE ENERGY WITH RADIANT HEAT

Radiant heat enables homeowners to increase their comfort while also saving money on utility bills. By employing a zone heating system, unused rooms can be turned down to reduce energy bills. Another energy savings comes from lower thermostat settings. When both air temperature and radiant transfer are compensated for, people feel comfortable at lower room temperatures and adjust the thermostat accordingly.

Heat loss from the outside of the home is also a factor. Conventional systems locate heating registers along outside walls, under windows and in front of sliding glass doors to compensate for all those cold surfaces. That hot air goes up those cold outside walls, across the ceiling and down to the cold air return, losing a lot of heat. Conversely, radiant panels direct the heat to the interior of the space. This can result in energy savings of 10 to 30 percent in most residences.

—Source: Radiant Panel Association, www.radiantpanelassociation.org

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In-slab radiant heat systems can also heat driveways and walkways to eliminate snow and ice accumulation.

instructions, but the systems don't all install exactly the same. Refer to your manual for specifics.

The Right Stuff

With two different but proven systems for radiant floor heat, which one makes sense for your home?

In the case of constructing a new home, a hydronic system will likely be the best choice for use as a sole source of heat for the whole house. If you're building a new home and want to use radiant heating to "spot warm" the home, hydronic may still be your best bet. Compare prices for both types of systems and explore the varying products on the market. Keep in kind that electric systems have electricity as their sole utility. Water, on the other hand, can be heated by almost any utility, including natural gas, propane, oil, wood, solar or electricity. Your choice will probably boil down to the energy costs of the available utility and the size of the project.

Electrical systems may be your best option when remodeling, because hydronic floor systems can elevate the floors by a couple of inches, resulting in additional remodeling work. Some thin electrical systems only elevate the floor by about 1/8 inch.

Also, consider the way the systems work. The concrete slab of a typical hydronic system can take a few hours to heat up. Electrical systems, on the other hand, usually take between 30 minutes to an hour to heat up. In most cases, electrical systems are governed by a timer and a thermostat that homeowners preset with on/off cycles. While the electricity cost of generating 1,000 Btu's may be less expensive with a hydronic system than with an electrical one, the way the systems operate plays a major role in energy costs. Hydronic systems are generally left on for a period of months to accommodate the

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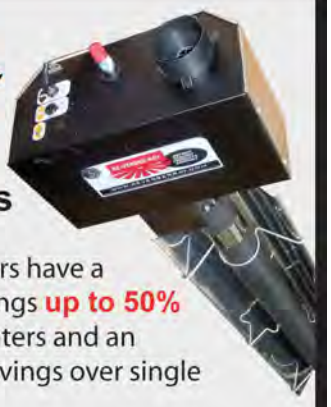

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lengthy heat-up time of the systems. Electrical systems are usually timed to switch on and off according to when the homeowners will be at their house. The many "off" sessions cut down the cost of electricity. So consider your lifestyle and how you will be using the heating system.

Cost of installation depends on the nature of the job. For remodeling projects or single-room installations in new homes, hydronic systems will cost more to install. However, in large jobs such as whole-house applications in new construction, an electric system will cost more.

More than Floors

Beyond floor heating, breakthroughs in radiant technology are giving rise to some new and interesting home-heating applications. Advanced electrical cable systems

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can now be extended into intricate spaces, such as shower stalls, benches and platforms. The latest NuHeat Cable System offers excellent installation flexibility. Installers can make on-site adjustments to any room, including those with tricky curves and angles.

Some radiant products are sold as self-contained panels for single-room heating. Enerjoy PeopleHeaters, from Solid State Heating, are fast-acting panels that deliver instant radiant heat and comfort. The panels can be used alone as primary heat or in combination with any heating system. Available in 120 or 240 volts and a variety of sizes and wattage outputs, the Enerjoy surface-mounted panels can be secured to walls or ceilings as easily as installing a light fixture, with no need for instrusive remodeling. Also available are T-bar panels for suspended grid ceilings, Woodshop ceiling panels and smaller under-desk heaters. The company's Bathroom Comfort Center includes an Enerjoy heat panel, exhaust fan, light, night-light, three-way rocker switch and a white Euro-style thermostat.

Roof de-icing systems are a smart investment to protect your roof during winter. Freeze/thaw conditions can form ice dams and icicles around eaves, drains and valleys, which cause structural damage and leaking. Snow accumulation can also create a heavy weight load on roofs. Some de-icing systems use electrical cables or mesh as the heating elements, while others use PEX tubing to transfer heat to a customized aluminum panel. De-icing systems are available for all types of applications, including new construction, remodeling and existing roofs.

Baseboard radiant heaters employ a similar zone-heating concept. For example, with the Hydro-Sil heating system you can heat selected rooms or the entire house with permanently installed baseboard heaters wired into your home's electrical system, or you can heat individual rooms with completely portable units.

And thanks to radiant heating, you can say goodbye to slipping and sliding on icy sidewalks and shoveling snow. A hydronic system with durable PEX tubing embedded in your sidewalks and driveway delivers warm water that melts ice and snow. These systems use a sensor that is triggered by cold, wet conditions. The sensor automatically activates the system, which stays on until the ice is melted. With no icy walkways, the outside of your home is much safer for your family and visitors, and you can throw away that snow shovel.

As radiant heating grows in popularity, we can expect to see more uses for this technology to heat our homes in new and efficient ways.

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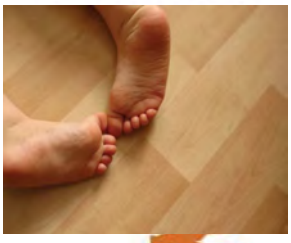

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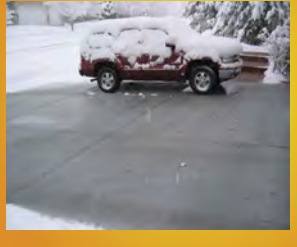

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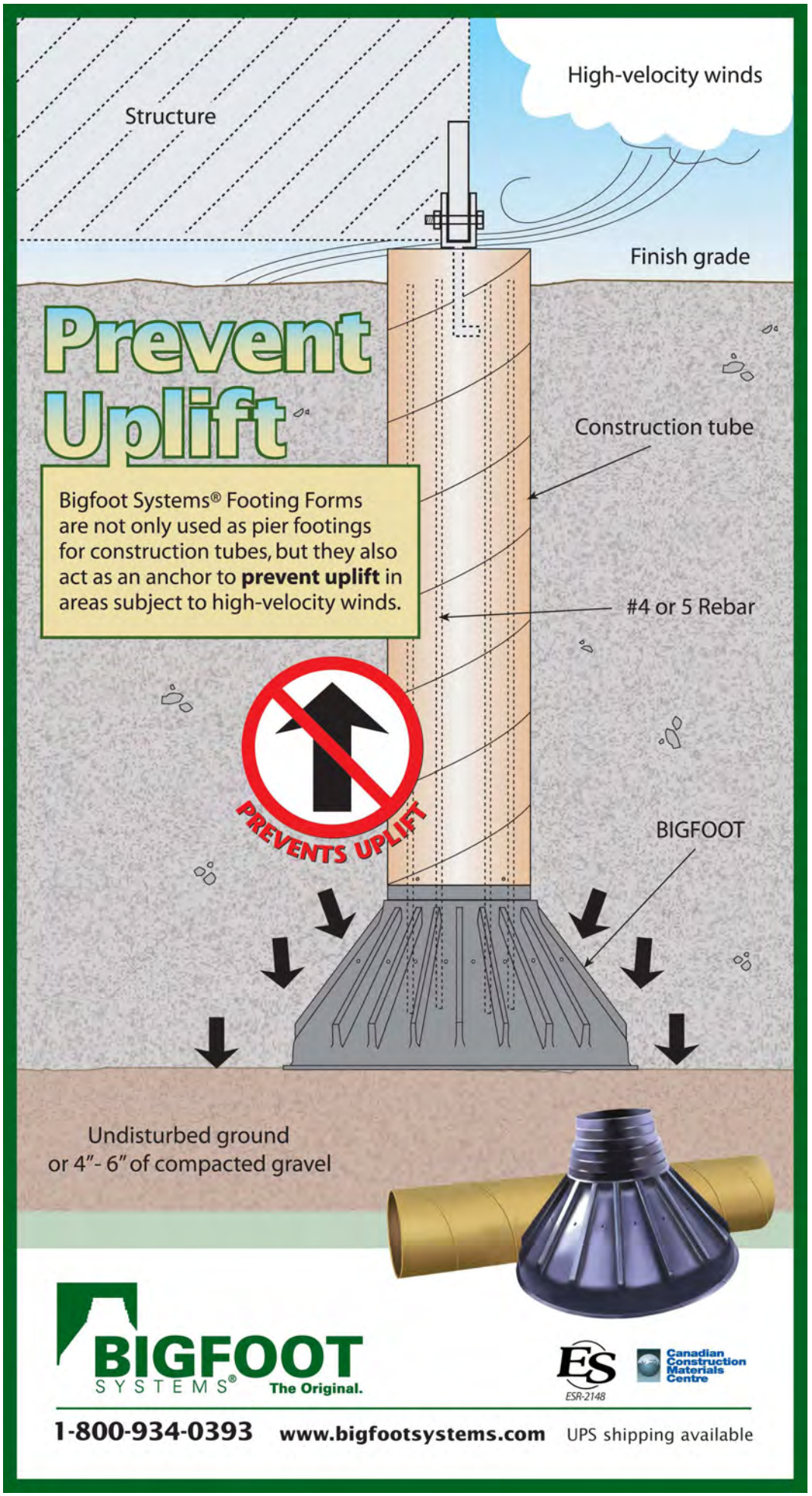
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DIY GARDEN STORAGE SHED

By Kevin Hayes

Being of sound mind and body didn't stop me from bragging to the entire neighborhood, family and co-workers that I could build an APA Handy Plan project in one long weekend. I chose the Garden Storage Shed, an 8-by-12, 96-square-foot potting shed with four walls, three windows, two roof lines and a sliding barn door. (See sidebar on page 70 for plans).

On paper this looked like a fairly easy build for a person with my skill set. I framed the exterior walls of my own home using structural insulated panels (prefabricated wall panels that join together in a mortise-and-tenon fashion).

A Tale of Extreme Procrastination

I've built decks and fences, laid roofing and tiles, run electrical and even assisted on a retail store remodel installing slot-wall panels, carpeting and fixtures. My weekend warrior paraphernalia was solid: circular, chop and jig saws; framing and speed squares; framing and torpedo levels; variable speed drill; hammers, wrenches, caulk, measuring tapes, chisels. I had other reasons for overconfidence: The contractor who built my house lived across the street; the guy who built the original APA Garden Shed prototype

This project was built using instructions in APA's "Garden Storage Shed" Handy Plan. For a printable, downloadable 23-page instruction manual complete with materials list, step-by-step procedures and detailed diagrams, visit www.apahomeprojects.org.

several years ago, still worked at APA; and my brother, who is chronically short on spending money, was my hammer on-call should I need an assist. And what dad could pass on the chance to introduce his two sons to the building craft?

"GameBoy be damned, we're going to build the most enviable shed in the 'hood, boys," I told them.

Finally I had to tie my wife into the project. The shed was her belated Mother's Day present. In our house, all Mother's Day presents are belated. The boys and I put the finishing touches on her 2005 flagstone patio present in March 2007. And so, with all the bravado only a PR specialist can muster, the shovels broke dirt on the four-day Memorial weekend.

MAY

Siting the shed

There aren't many flat spots on my highly sloped lot. I chose an area that abutted the property line fence to the southeast and an old 40-inch stump to the northwest. This tight location would prove nettlesome. After watching the boys chip through the Northwest glacial hardpan for an hour, I realized that we needed to get that stump out of our way. The Stump Guy could not come until Tuesday. Before a hammer was even lifted, my get-er-done-in-a-weekend-timeline was kaput, finito. Whew, that was a relief. Now I could build at my own pace—glacial, just like the rock-strewn soil.

After spending $262 for the stump removal, I brought in a gravel base of 1-1/4-inch minus to a depth ranging from 4 to 8 inches. I used a rented plate compactor to apply the finished grade. It was mid-June before the first lumber hit the ground.

JUNE

Floor Installation

Going with the gravel base meant I'd be using a plywood floor on treated 2-by-4 framing. I had the luxury of laying out all the main components in my garage. The flat surface helped telegraph any imperfections. Sure enough, one of my 12-footers had a nasty bow, which meant either halt work and roll back to the lumberyard or deal with it later. I told myself the weight of the shed will surely flatten this section down, so I moved on, paneling the floor with 3/4-inch square-edged plywood. Later I would learn two lessons: Warped studs usually don't flatten out by themselves, and if you can't shim, hide it with trim.

Wall Construction

I opened my plan to page six: the right and left side walls. I cut all the panels and then laid out the studs. In hindsight I should have laid out the frames and then cut the panels to fit the frames. The boys were very excited to get started with the chop saw. They argued over whose turn it was, so we set up the alternating cut plan. They cut the studs, I watched their fingers, and our progress was slow. This was a learning experience for all of us.

The intersecting rake walls found on page 16 looked pretty straightforward. I laid the bottom plate out and cut the end studs and center stud to length and tacked them to the sole plate. I then placed infill studs 16 inches

The author's sons and big Mikey (center), dig out the ground for the shed's gravel foundation.

All the wall sections were constructed in the garage starting with the two rake walls. The author used a combination of dimension lumber and LVL studs.

Looking northeast to the left side wall. There was about 18" of clearance between the fence and the eastern wall. It would become a problem during the paint phase.

Only one month into the project and two walls are standing. The earth is warming up faster than this project is coming together.

The author's son gets into the act applying T1-11 siding to the front wall section.

An elaborate attempt to plumb and level the left corner involved this rope and pulley system. Note the handy shovel for gravel in-fill where needed.

o.c. (on center). Using the top plate as the guide, I ran a pencil line across each of the infill studs, cut them to fit and nailed it all together. The plan called for galvanized nails as required. Once those are sunk, they are hell to get out, an exercise I repeated near daily. My builder neighbor finally brought over some vinyl coated sinkers and that sped the reconstructs up quite a bit. The overhangs were pre-drilled and screwed together. I did not want to split the small block that formed the end.

This drop-in header was a marvel of craftsmanship. The cripple studs only vary by 1" from one side to the next.

When applying my pre-cut T1-11 siding to the frames, I found the fit was not picture perfect. As my brother would say many times throughout the project it was, "Good enough for the girls we go out with." His other favorite: "We ain't building a Swiss watch." I embraced those phrases with great vigor as the project wore on. By the end of that first day, we had one wall sheathed and ready to stand. However, after one day of work with dad, the boys were already tired of the "shed." Even though I was paying them by the hour, the shed had become another one of their chores that devoured precious goof-off time with their friends.

The roofing crew installed filler strips to the skylight roof. Note the mondo gap where the walls meet. Would 1x4 trim be large enough?

One of the walls called for an aluminum casement window, which I could not find so I bought vinyl sliders from the local big box. (All three windows were nailed to the exterior siding, flashed, trimmed with 1-by-3 whiteboard and caulked.)

After the two end walls were standing, I tackled the rear wall. I reviewed pages 12-15 and 17-18 to get the clear picture. There is a double top plate underneath the skylight, which is also right above the outward swinging doors. The rest of the framing was single top plate with 16-inch o.c. studs. The actual skylight framing would come later—much later.

With three walls in place I could get an idea as to how the skylight roof lines were going to match up. They weren't. That bowed floor stud started to bite the project. I was about 1-1/2 inches low on the window side. After much laughter my neighbor, the builder, brought his expertise into play. We lifted one corner of the shed with a shovel until our string line across the back was level. I wedged a piece of treated 2-by-4 under the floor joists and filled in around it with extra gravel. You couldn't even see it. The floor felt solid and level. All well and good … for now.

JULY

Front Wall and Tracking Down the Barn Door

The front wall is shown on pages 9, 12 and 13 of the Handy Plan. I built mine in two sections and dropped in my version of a header. I screwed strap ties to the 2-by-6 LVL header and cripples, and then nailed through the trimmer into the header on each side using 3-inch sinkers. This wall could certainly be framed as one unit and stood in place. I did not know where my next help would come from, so I chose smaller sections to work with.

The author's brother (with ladder) and the roofing pro put the lipstick on this pig, four days after their estimated completion. Nonetheless, the shed is starting to look acceptable.

I changed the clerestory layout to accommodate the two 12-by-18-inch sliding windows. I cut and nailed the siding in place, leaving the bottom nails out so I could slip the 6-inch metal roof flashing underneath when the time came. I would install the windows after the roof was on.

Sliding barn doors are expensive and not as easy to find as one might expect. Forget the local big boxes in urban settings. I knew I'd have to go out where the lettuce grows so I called several stores about 10 miles out of town, and finally found one with the kit. Upon arrival, I was told they were out of rails, so they sent me to another location even further out. This place only had 10-foot rails and I needed an 8-footer. I bought a metal blade for my chop saw. The door kit, gas and saw blade came to $120.00. In the end it was well worth the time and expense.

Roof Erection, Clerestory Deconstruction

The shed went into hibernation for about three weeks while I debated my next move. I had four walls standing, but I knew the roof was not going to be easy, given the fact my earlier jiggering with the floor had fixed only the skylight roof line. It was about this time that my brother called, wondering if I had any work around the house. I told him about the project, and he mentioned his roofing partner was looking for side money. Bring it on, I told them. The beer-drinking saviors arrived in late July. They looked over the work and declared, "We should be able to bang this out in a day or two." Get-er-done must run in the family. We donned our tool belts and hit the ladders.

The clerestory required some adjustments.

The author installs folded composite shingles opposite the wind direction to finish the front shed roof.

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The first order of business was to remove all the siding from the clerestory window section. The rafters had to tie into the studs, not the siding. Later we could recut the panel sections to fit the revised layout.

The roofing pro and my brother started measuring the rafters on the skylight side, and that's when their pace went glacial on them. They had different cuts from one side to the other. My neighbor had forewarned me that if you are out of whack on the floor, you're going to chase it all the way to the top. The chase cost a couple hundred bucks and a half-rack of beer, but the saviors were able to sheath both roof lines and shingle the front section before I left on vacation in August. Another plan difference was my use of composite roofing instead of cedar shakes. I wanted to match the roof on my house.

AUGUST

Vacation. I still had the whole month of September to install the clerestory windows, shingle the rear, install the homemade skylights, trim out the walls, install the doors and hardware, build my countertops and storage bin and paint the thing. Piece o'cake.

Working through the rain, the author's brother begins the first course on the back shed roof.

Step flashing the skylights went smoothly. Once the windows were in place the author applied a peel and stick membrane that capped the skylights.

SEPTEMBER

Did I mention that we usually get nice long Indian summers and the rains don't really start pouring until late October? September was not a total waste. My football teams stink to high heaven this year so rather than watch their disgusting play, I installed the barn door and studied for my upcoming skylight exam.

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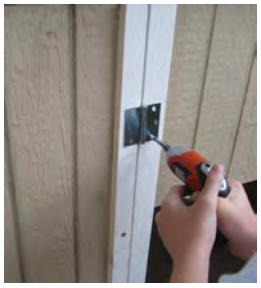
The author missed the bottom of the frame. The Plexiglas was later cut right about where the sealant ended.



1x2 trim was glued and screwed to the door frames, and the hinges were fastened to a piece of 1x3 trim nailed into the siding.

OCTOBER

Now it was go time. The Indian summer lasted about 36 hours. I called for my brother, the hammer, and he came in for a $150 stretch of labor that saw us install the clerestory windows, roofing and most of the siding and trim. We got the skylights framed in. For the window flashing I used a peel-and-stick rubberized aluminum roll flashing. I cut the 6-inch material in half and pressed it into place all around the flanges. Though not a typical window flashing material, I liked the adhesion to both wood and plastic. (We've already had several wind-driven monsoons, and the windows are not leaking yet.) Bro and I were on a roll. He left late Sunday night after we had planned out the final week of action. It would be the last time I saw him.

Without going into the whole story, he would be hamstrung with legal and municipal matters for a little while. It was not a good time for either of us. I had failed the skylight exam. The 1/8-inch Plexiglas panels sit in a 3/4-by-1/8-inch channel that runs along the perimeter of the skylight framing. The top header is a 2-by-6 notched at the ends and in the center where it slides over the center rafter. Along the sides are 2-by-2's, each with the same 3/4-by-1/8-inch channel. They are nailed to the roof sheathing and line up with the ends of the top header. The middle stud is a flatwise 2-by-4 channeled with the grooves running down each side. A 1/2-inch

Author and sons enjoy calm before the paint storm.

The hinged doors still need the hardware and a bit of paint.

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filler strip is nailed beneath the center stud so that all the channels are at the same height along the perimeter. My heights were perfect, the openings were surprisingly square and one dry fit showed the grooves were deep enough. I caulked the groove with a urethane sealant and set the windows. Crap, too long. They stuck out about 2 inches beyond the rafter tails. Then it hit me. I forgot the bottom of the window frame.

The oldest son had to step up, and he did. He helped remove the gummed-up windows. We cut 2 inches off the Plexiglas using my circular saw with a fine-tooth blade running backwards. The saw slowly melted the plastic. The technique worked better than I expected. I nailed a 4-foot piece of 1-by-4 trim to the ends of the rafters and reseated the windows. I then cut and beveled four pieces of 1-by-2 trim. These were glued and nailed above and below each window for stabilization. Finally, I installed the trim and caulked all the joints. Another ugly win was in the books.

Shown are the interior countertops and the top to the outdoor storage bin (trimmed in red).

Home Stretch

I started on the interior storage and countertops, working through the long rainy weekend. The punch list was then down to about 14 items. The shed appeared to be nearing the end. The rest of the family, including my wife and one of my son's friends, pitched in to paint the exterior walls and trim, while I banged away at the punch list. The DIY Gods had given us three consecutive days of 50-degree temperatures. Our paint would adhere just fine.

The cabinet was a gift from the builder neighbor. The plan could not have been built without the trusty shim.

Miraculously, the weekend project was finally over. (Okay, I have about three tiny items to finish.) It had consumed an entire summer and half the fall. It provided comic relief for the neighbors, friends and co-workers. Eleven people had a hand in the construction including my wife, who rarely complained. In the final review, this plan is written for an advanced DIY'er. A person with framing and roof construction experience should have no problem building this project.

I, on the other hand, spent far more than I should have—nearly $3,000 dollars. I had built a Swiss watch. But it was good enough for the gal I married. Happy Mother's Day!

Working to the last minute, the author snapped one last shot of his project before hanging the tool belt for the night.

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By Mark Clement

Hangin' Out

Build an awesome Kid's Cubby to organize children's stuff—and more.

I've learned a lot since becoming a dad 6 years ago, like those timeless life-lessons you see in the movies. But I've also learned something else, maybe a little more mundane, but with no less effect on my everyday existence—kids have lots of stuff! And, this brings me to another point: So do we.

It's overwhelming and it all needs to go somewhere. If you have an old house like mine, then it's a double whammy because the toaster-oven-sized closets in old homes don't leave much space. The same thing applies if you have a closet-less mud room, use a garage entrance, or even a foyer—there's no place to put anything.

The result, of course, is that coats get piled where they shouldn't, backpacks are loaded on the floor, and all the other hats, mittens and kid-related stuff that comes through the door lives in an unseemly pile.

To that end, I built the Original Kid's Cubby (see sidebar) for my mud room some years ago and it has been piled high with kid stuff ever since. Lately, however, it is my daughter's room that's gaining critical mass, and she needs more space to store her stuff. Enter the Deluxe Kid's Cubby.

It's got two levels for storage, it fits snug to the wall, and it looks pretty cool. I made this one out of 1-by-6 No. 2 pine boards in an afternoon and finished it with boiled linseed oil. Of course, you could also paint it for a different look. (I'd use Select Pine or Poplar for paint; the knots in No. 2 stock will bleed through the paint.) Assembly is pretty straightforward, and there's some fun scroll work and routing to keep your tools in condition.

One more thing: The piece here is 40 inches tall and 34 inches wide, because I sized it for the space it'll live in. Of course, the design is scaleable so you can make either cubby to the dimensions that work best for you and your kids.

Layout

Design Tips. One of the keys to making workbench projects like this is using design to keep some of the edges from lining up and to make the unit

Measure and mark all pieces.

Cut all pieces to length before assembly.

look proportional. In other words, make the top wider than the sides and the sides thinner than the top. This gives the unit a little direction as it grows up the wall. Add a scroll detail at the bottom for a gentle effect that sweeps the lines gracefully toward the floor at the bottom.

CUT LIST

This is one of those projects where you can cut everything ahead of time without too much worry. Everything is made from 1x6.

- Top: 34 inches
- Sides: 40 inches—rip to 4-1/2 inches wide on table saw
- Bottom Shelf: 30-1/2 inches—rip to 4-1/2 inches wide on table saw
- Backers: 30-1/2 inches

Scroll cuts, Routing, Sanding

Making scroll cuts. The trickiest part of this whole thing is making the scroll cuts. What I like to do is draw (free-hand) a scroll pattern out on a piece of stock and

Rip sides and backers to proper width on the table saw.

After drawing a scroll pattern you like, cut it out of a scrap piece, then use it as a pattern and trace it on the finished stock.

get a shape I like. Then (after a few tries to get it right) cut it out with the jigsaw. The next thing to do is sand it just right so you can use it as a pattern piece for the actual shelf sides.

Once you have the pattern cut, clamp both sides to a sturdy work table. Before squeezing the clamps tight, make sure the sides are flush on all edges. Cut the scroll pattern using a jigsaw.

Double clamp both sides to the end of a stable workbench before cutting both at once. Cut both sides using a jigsaw. Enter the work from various angles so the saw can float—rather than be forced—around the curves.

Tool Tip: Some people—myself included—force their jigsaws around turns. This creates jagged saw marks and causes the blade to sway or bend. I've found that easing the saw into the work makes for a better cut. The key to working your way around

Use a spindle sander (or a poor man's spindle sander) to tune up the jigsaw marks left on the scrolls.

Follow up power sanding with some old fashioned hand-sanding as required.

If you're going to sand the finished piece, sand it before it's finished—in parts.

the scroll is to enter the cut from various directions (sort of like cutting a cope), so the blade meets the line going in approximately the same direction.

Sanding scroll cuts. I'm pretty sure you won't find this technique in any manuals for belt sanders, but since I don't have a spindle sander, I make due. Gently and carefully, I use the roller on my belt sander like a spindle sander and walk it the length of my scroll until it's smooth — like butta! Because I've left the pieces clamped together, they come out the same, and I do half the work. Run the sander on low speed to keep it from jumping.

Also, sand any routed edges, like this one on the top piece.

Center the backer using a marking gauge. I love using a 7-inch tri-square for this work.

Routing. If you're going to rout an edge on the top, now's the time. Have at it.

Finish Sanding. If you intend to sand all the parts of your Deluxe Kid's Cubby, its way easier to do it now than once it's assembled. A random orbit sander will really tune up any marred wood and bring up the grain to accept finish well.

Assembly and Installation

Top and Backer. My cubby worked nicely with the top overhanging the sides by 1-inch on each side. So, at 1-3/4 inch inward from the edge of each side I made a light square line across the bottom of the top-piece. This indicates the location of the backers and gives me a square line to use when I apply the sides. With the lines drawn, fasten the top to the backer.

Keep it all together with glue. Pre-glue the edges before assembly. Now, I know this is construction adhesive, which works. Wood glue also works.

Assemble the pieces on a flat, stable surface.

Tool Tip: "A little dab will do ya'" applies to glue as much as it does to hair cream. I like to glue and nail this project. A finish nailer works great here for quick fastening, but screws also work just fine.

Sides. Installing the sides does two things for this project: First, it gets the sides on (handy how that works); but second, installing them tightly to the top and backer squares everything up, so you get a nice, snug fit. Wipe away any glue that squeezes out as you go.

Nail it together. A trim gun or brad nailer is nice for this, but trim-drive screws also work fine.

Hit the ends with glue before adding the sides. The glue will hold pieces fast as the wood moves over time—much better than nails.

Bottom Backer and Bottom Shelf. Installing the top of the bottom backer 12 inches up from the end of the scroll cut worked nicely for this project. Make a mark on each side and square a light line across. Install the bottom backer by popping three nails through each side.

Design Option: Install a shelf on top of the bottom backer. Fasten through the sides and down into the bottom backer.

Installing the sides squares up the top/backer assembly.

A finish nailer works great for this project.

Install the bottom backer using glue and fasteners. I like this about 12 inches up from the bottom.

Mark the locations for the "hooks," which are old-fashioned hard-cut nails in this case.

"**Hooks.**" The hooks on my kid's cubby are hard-cut nails, which are easy to install, stay put, and give it a colonial look. Laying them out on a center line along each backer about 5 inches apart worked nicely. I then pre-drilled each hole on a slight upward angle (clothes and things hang better when the nail is tipped up a little) and then tapped in each nail. Be careful not to drive the nail through the rear face of the backer.

Use a drill-driver and pre-drill pilot holes at a slight upward angle for the hooks.

Gently drive the nail-hooks in. Make sure not to drive them through the backer.

Apply your preferred finish.

Installation. Installation is pretty easy. Mark the location you want the piece on the wall, then locate studs. Next, strike a level line. Place the piece on the wall and fasten with trim-drive screws. Make sure to catch studs. I used trim-drive deck screws with painted heads that masked the fastener somewhat.

Editor's Note: *Mark Clement is author of* The Carpenter's Notebook *and* Kid's Carpenter's Workbook, *Fun Family Projects! Visit www.TheCarpentersNotebook.com.*

THE ORIGINAL KID'S CUBBY

The Original Kid's Cubby is much smaller than the deluxe version. While the first Kid's Cubby's I made are wall-mounted in my mud room, the Deluxe version I made here finds its home on the back of my daughter's bedroom door. I also added some small details you can use on any kid's cubby:

Instead of putting the routed edge on the top of the shelf, I flipped it over and put it on the bottom. And, once assembled, I routed a chamfer along the bottom edge of the backer to add some shadow lines. Hollywood isn't going to call me to design any sets because I did that, but it brings some nice detail and was fun to make.

Hollywood is more about the stories our kids bring to us, anyway, and the life lessons that change us for the better.

By Matt Weber

Easy Homemade Wood Jigs

Here's a look at a few simple homemade tools and jigs that can prove useful on all sorts of DIY projects. A "jig" is an accessory used in woodworking or metalworking that controls the movement or location of a tool. Most jigs are templates or guides to boost the performance of a tool, often custom-built to add precision or ease-of-use to a particular job. The term "jig" is a broad one, because it can apply to virtually any creation, whether store-bought or shop-built, that can make your job easier. There are tons of woodworking books with pages upon pages of jigs you can build for drill presses, table saws, routers and router tables, circular saws and more.

Over the years I've built a few that I use for all sorts of projects—jobs you'll face when working with anything from sheet goods to trim carpentry. Included here are four simple jigs that you can make at home and use for a wide variety of DIY tasks.

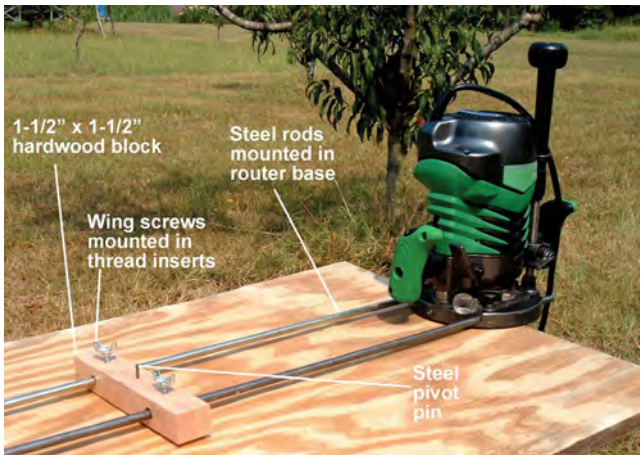
Install thread inserts to secure the bars in the circle-cutting jig.

Circle Cutter for the Router

From constructing an arch to creating a table top, you will occasionally find the need to cut a large circle in plywood. This can involve precisely measuring and scribing a large circular line and then carefully following that line with the blade of a jigsaw. This can be time-consuming and tricky if you don't have firm control of the saw (or your tape measure). However, once you've constructed the router jig shown, you'll have a new tool ready to guide your router around an axis, cutting the exact radius that you locked into the jig.

This circle-cutting jig is a simple design in which the router is guided by two 36-inch steel rods that pivot on a pin inside a simple wood brace. I picked up all the materials at the local big-box store, with the exception of the screw insert kit that I found at an auto parts shop.

The wood brace is made of an 8-1/4-inch block of 2-by-2 oak or



Shown are the basic components of the circle-cutting jig.

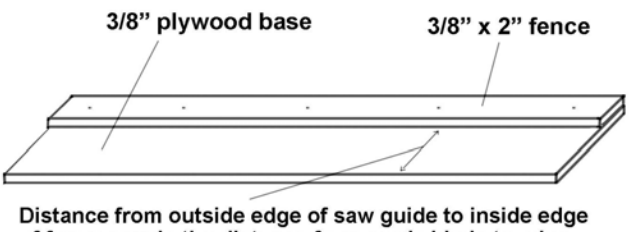
other hardwood. The block is custom-fit for my router, so you may need to alter it to fit your own—what matters is that it spans the width of the router base. First insert the steel rods into the slots in the router base that usually hold an edge guide. I used 3/8-inch rods so the thumb screws in the router base would tighten against them securely. Some smaller routers may require 1/4-inch rods. Square up the rods so each is protruding an equal distance from the router and lock them in place with the thumb screws. Center the wood block against the rods and mark the location where their ends should penetrate the block at 90 degrees. Drill two holes through the block slightly larger than the size of the rods.

Mark locations for the threaded 1/4-inch (20) inserts on the top of the block, centered directly above the rod holes. Drill these holes into the rod's "tunnel" but not through the entire block. Tap threads into the holes using the tool included with the insert kit. Then screw down the inserts. The 1/4-inch wing screws (or plastic knobs) are screwed into these inserts to tighten down against the rods, locking the wood block in place.

The straight-edge guide is a handy accesssory for cutting plywood.

In the center of the top of the block, predrill a hole and drive in a 1/8-inch steel rod, cut 1-3/4-inch long and ground to a point. This is the pivot point of the jig.

To set the radius of your circle, simply measure from the center pin to the cutting edge of your router bit. Adjust the circle guide accordingly, and lock everything together with the wing screws and router base. Use the whole assembly like a large compass, which can cut almost 72 inches in diameter.

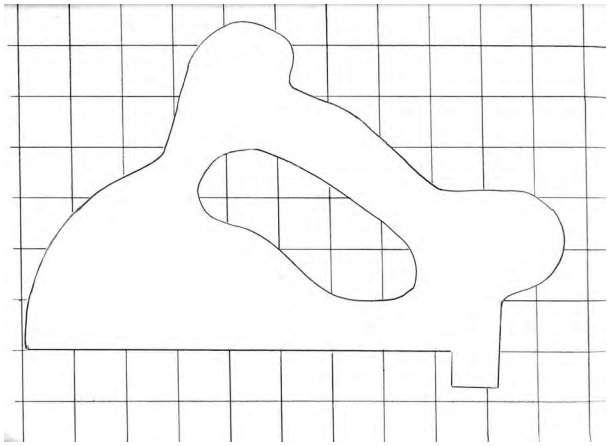


Distance from outside edge of saw guide to inside edge of fence equals the distance from saw's blade to edge of saw's base plate. Pre-assemble jig with plywood base wider than neceassry and then cut to size.

Straight-edge Guide for the Circ Saw

Large, 4-by-8-foot sheets of plywood can be a hassle to handle, especially if you're working by yourself. Cutting them to size is no picnic either. When rip-cutting a sheet of plywood lengthwise, a straight-edge guide for your circular saw can take some of the headache out of this

This simple push stick is a big help with table saws.



The drawing to the right is a scale diagram, with each square representing 1 square inch.

task. I've gotten a lot of use from the homemade version shown, which only takes a few minutes to assemble.

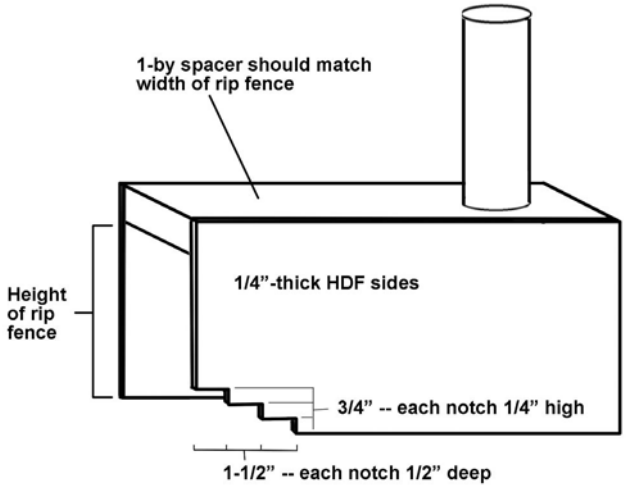
The saw guide consists of two very straight boards, and I used 3/8-inch plywood for each piece. Each board is 52 inches long. The top piece is a 2-inch-wide strip, which serves as a fence, clamped flush to one side of the base piece. Fasten the two pieces with wood screws and a little glue. Be sure not to drive the screws through the bottom of the base piece. The width of the base that is exposed beneath the fence must be wider than the base plate of the circular saw. Then, run the circular saw over the entire assembly with the base plate flush against the fence, cutting away the excess plywood base. This customizes the saw guide to that particular circ saw (circular saws vary in size, so the guide will probably only fit the saw used to create it). To use, just align the edge of the saw guide's base with the marked cutlines on a sheet, clamp the guide securely and run the saw down its length, holding the saw's base plate firmly against the top fence.

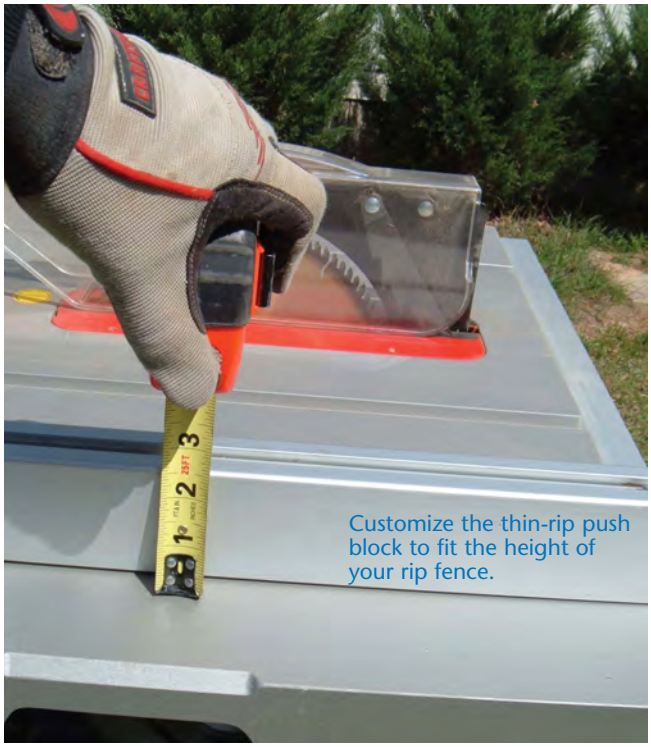
Simply draw your plan on the work piece, cut it out with a jigsaw, and round the edges with a router.

Two Push Sticks for the Table Saw

A push stick is one of the simplest jigs or accessories you can make, but one you'll use every time you pull out the table saw. A good push stick should provide plenty of control of the workpiece while keeping your fingers safely away from the blade as you feed the work over the cutting edge. Some push sticks push only from behind the workpiece, but this can cause some materials to rise

The thin-rip push block is ideal for ripping narrow pieces.


1-by spacer should match width of rip fence
Height of rip fence
1/4"-thick HDF sides
3/4" -- each notch 1/4" high
1-1/2" -- each notch 1/2" deep



Customize the thin-rip push block to fit the height of your rip fence.

and/or buckle over the blade. A better design, such as the homemade model shown, allows you to push the workpiece from behind as well as from above, holding it down securely against the table.

I made the first push stick from a scrap of 1-by-8 No. 1 pine. The handle is closed at both ends so it won't easily break off. Simply draw the design on the workpiece as shown in the grid. Cut it out with a jigsaw, and then use a router with 1/4-inch round-over bit to ease the edges of the handle for a comfortable grip. That's all there is to it, but this thing gets used every time my table saw gets powered up.

The next push stick came from some instructions I found in a book titled, "120 Shop-tested Tips & Techniques," edited by Terry Strohman. I'm not sure if this is Strohman's original design, as there was no specific author listed. But I cannot take credit for the idea, and it's a good one. When making very narrow rip-cuts on the table saw, it can be difficult to guide the work accurately because you should never use your bare hands. Trouble is—most push sticks are too large.

The thin-rip push block shown should be custom-built to fit your particular rip fence, so dimensions will vary. It functions like a three-sided sleeve that rides atop the rip fence. The push block is 7 inches long. The two sides are cut from 1/4-inch high-density fiberboard and bridged by a 1-by spacer (scrap pine, in my case). The spacer should be cut to match the width of the rip fence. The sides should be cut to match the height of the rip fence plus the 3/4-inch thickness of the spacer. (Make sure the sides are cut high enough that the spacer clears any bolts on top of the rip fence.) The hardboard sides are glued flush against the top edge of the spacer. The handle is made from a 3/4-inch dowel, cut 4-1/2 inches long and glued onto the rear top of the push block.

This thin-rip block is a simple design, but here's an extra feature that adds to its performance: stair-step notches that fit stock of varying thickness. On the side piece that faces the blade, use a jigsaw to cut three successive notches as shown in the diagram. (Do this before assembling the block.) Each step is 1/2-inch deep and varies in height by 1/4 inch. This means the side of the push block can "bite" downward on the workpiece, from thin 1/4-inch stock up to thicker 3/4-inch stock, while also pushing from behind. To use, just set the thin-rip block over the fence with the corresponding notch over the workpiece. Push the stock forward into the blade, holding the work firmly against the rip fence with a scrap of wood. For more information on the thin-rip push block and other woodworking jigs, visit www.woodsmith.com.

I made the sides from HDF and the spacer from 1-by pine.

Glue a dowel in place for the handle.

By Larry Walton

Heavy Metal

Recycling the last of your parts car

If you do much wrenching on a budget, the odds are pretty good that you will end up with some scrap parts and maybe even a "parts car" somewhere along the line. Growing up in the country, I was used to having a disabled vehicle or two around the house. In fact, almost everyone I knew had a junk car or two out by the barn—not exactly the décor I want now.

When our son, Tim, brought back his highly modified Subaru 2.5 RS after it was totaled in an accident (not his fault), he pulled it into the garage and pulled every conceivable part he could to put on the stock car he bought as a replacement.

Of course, the main project was to salvage his race-tuned turbo engine and transmission, but because the wrecked car was newer and had a preferred interior color, he stripped many more parts off of it as well. He removed the sub-frames and suspension systems, dash, steering wheel, seats—you name it.

What was left was a non-rolling hunk of scrap metal that had outlived its welcome in the garage. We sometimes dispose of vehicles by calling a wrecking yard to come and get the car at our location. We save the hassle of hauling off the car, and they benefit by selling car parts and scrapping the rest.

However, this car body was so stripped that it wasn't worth much to the junkyard—plus, it was in the garage without a single wheel on it. Besides, we kinda like winching and hauling stuff.

Here's how we disposed of the remainder of the infamous junk car to keep our place from looking too "down-home:"

First we stopped by Bee Hive Rental to pick up a tilt-bed trailer. Because our car had no sub-frame, no axles and no wheels, we needed a unit with a very thin lip at the bottom of the ramp.

The next order of business was to get the car rolling so we could get it out of the garage without destroying the concrete floor. Years ago, I made

WHEN IT RAINS IT Spores

YOU CAN'T STOP RAIN, BUT YOU CAN STOP MOLD GROWTH.

Every home contains millions of thirsty mold spores. Without water or moisture, mold spores just sit there and do nothing. Microbial couch potatoes. But when water leaks into the walls or basement or attic, mold spores go on a feeding frenzy. And that frenzy only gets worse when the lawyers grab a seat at the table.

APA – The Engineered Wood Association and its member companies provide homeowners with the necessary construction guidelines and maintenance tips to help prevent moisture intrusion problems. If you plan to remodel an existing home or build a new one, visit **www.buildabetterhome.org.** Our site includes more than 70 foundation, wall and roof construction details available in four PDF brochures. You can also find a maintenance plan for existing homes at **www.FreeFromMold.org**. You'll know what to do, when to do it, and how to get it done right. Visit us today and keep the mold from feeding on your home.

APA
THE ENGINEERED WOOD ASSOCIATION

a dolly from two layers of plywood and some casters to move my wife's 1907-built piano. Over the years we have moved lots of heavy stuff around the property (engines, transmissions, etc.) with that piano dolly. We figured we could use casters to make a simple dolly for moving the parts car as well.

We used a chainsaw to cut 4 by 4 cross beams for the car dolly. My son

thinks I try to use a chainsaw on every project. I figure if the best tool for the job is a chainsaw, then why not?

The length of the beams was determined to extend a few inches past the reinforced seam (or "pinch weld"), where the pan meets the body, and still fit between the trailer's fender wells.

We picked up four casters at the home-improvement store and used

one as a template to pre-drill holes into the 4 by 4s for lag bolts. Out of habit, we grabbed a cordless impact drill to drive the lags. After thrashing the socket-driver bit we woke up and started using the automotive air impact driver, which has a much

heavier drive. Duh!

Caution: Before attempting any of the following stuff, hire an engineer to spec out load ratings, angles of approach and avenues of escape. Seriously, don't trust the floor jack, the casters, a homemade dolly or winch line. Stay out from under a vehicle that is being jacked and/or moved. Assume that heavy, elevated objects will drop.

After jacking up the car's front end, we removed the jack stands and positioned the front dolly beam. We

decided to leave the beams separate until they were positioned under the car because we had only one floor jack on site and could lift only one end of the car at a time.

We used the chainsaw (yes!) to cut some heavy wood wedges to fill gaps between the dolly beams and car body.

Jack points are hard to find with so many parts missing from the car. We needed an extra wood block to get the rear of the car off the jack stands.

We agreed before we started that under-the-car was strictly off limits during this entire operation.

We used a circular saw to cut plywood gussets to attach the front and

rear dolly beams. These plywood pieces do not provide structural support and are intended only to maintain spacing between the dolly beams and to keep the beams from twisting.

We used several 2-inch wood screws at each end to attach the plywood gussets to the dolly beams. Placing the screws at an approximate 2-inch pattern helped stabilize the beams from twisting.

A pin at the front of the trailer released the tilt bed from the subframe. With the trailer deck tilted,

we were ready to move the car out of the garage.

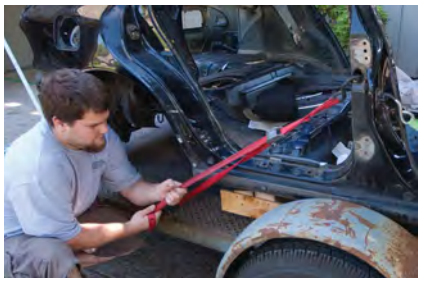
Once on the dolly, the stripped car was easily moved by one person out to the waiting trailer. We attached our Warn PullzAll winch line to the front dolly beam and the tail hook to the front of the trailer deck. Using a section of chain at each end of the winch operation avoided kinking the winch line.

We took our time winching the car onto the trailer, paying attention to the position of the dolly, the car body and how the trailer was reacting to the added load. At one point, we put a floor jack under the rear of the car to keep it from gouging the driveway.

With all of the caster wheels on the trailer deck, we reattached the

winch line at the gearshift opening and brought the car forward as far as possible on the trailer.

With the car in position and the trailer deck tilted and locked back



into the drive position, we used tie-down straps to secure the car to the trailer. With the load secured, it was time to head to the scrap yard.

We stopped at the scales on the way into the scrap yard so the scale operator could record our loaded vehicle weight. The equipment operator at the scrap heap used an excavator with grapples to lift the car off the trailer and onto the heap.

We stopped on the scales on the way out of the yard so the scale operator could record the unloaded weight of our truck and trailer combination. We then presented the slip to the cashier to get a little cash on the way out of the yard.

New Power Stapler Cuts the Cord

The new Arrow CT50 is a cordless staple gun utilizing a 10.8-volt lithium-ion battery pack. It shoots up to 1,500 staples per charge and delivers accurate, reliable, firepower right where you need it. A depth-of-drive control is adjustable for the hardness of the surface you're stapling. A built-in LED not only illuminates the work area but indicates exactly where the staple legs exit the gun. A staple-supply window indicates when the gun is running low on staples. And the quick-release battery and easy-to-operate staple pusher ensures you spend more time stapling than changing batteries and staples. A built-in battery meter measures how much power is left before it's time to change or recharge. Plus, the CT50 holds two full strips of staples, doubling the time between reloads.

Arrow Fastener Company
(201) 843-6900
www.arrowfastener.com

T-Jak Lends a Helping "Hand"

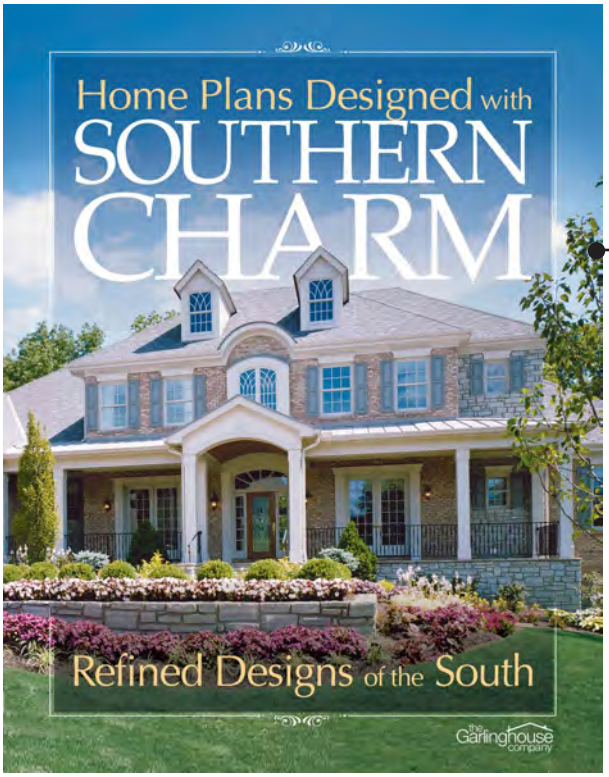
The lightweight, multi-purpose T-Jak was designed as a cabinet jack but serves so many other purposes as well. The T-Jak tool slides from 53 to 84 inches and supports up to 400 pounds. And the T-Jak is a breeze to adjust. By simply tilting the quick-release knob, the threaded rod is released and can be easily raised to the desired supporting height. Tilt the knob back in place to secure the threads. Then turn the knob for the final precise adjustments needed. When you need an extra hand, the T-Jak makes it easier to install kitchen cabinets, drywall ceilings, door and window headers, crown moulding, ridge rafters, tub surrounds and many other applications. To increase holding capacity, simply attach a 2-by-4 to the top. Also available is the Mini Brute for jobs requiring a range of 15 to 24 inches in height.

Patterson Avenue Tool Co.
1-800-662-3557
www.tjak.com

RapidSlide Wrench in a 10-inch Version

Cooper Hand Tools now offers a larger-capacity Crescent RapidSlide adjustable wrench, which provides easier and more accurate jaw adjustments in a larger 10-inch size. The RapidSlide wrench is named for its handle-positioned slide adjuster that replaces the traditional turning adjuster. Simply move the slide forward to tighten the jaws, backward to loosen them. Once adjusted, the jaws automatically lock securely in place, so there is no need to hold the slide while turning fasteners. The new 10-inch RapidSlide wrench has a maximum jaw opening of 1.2 inches, a 20-percent increase over the jaw capacity of the original 8-inch wrench. Both tools feature an extra wide handle that gives users more comfort and power, while putting less stress on the hand and arm.

Cooper Hand Tools
(919) 362-1670
www.cooperhandtools.com



New Collection of Southern Home Plans

"Home Plans Designed with Southern Charm" is the latest collection of house plans from Garlinghouse. Southern style home plans typically have spacious living space with volume ceilings and large wrap-around front porches. Most of the southern home plans have an exterior façade of brick, stucco or wood. As a major publisher of home plan books since 1907, the Garlinghouse Company has a long-standing reputation with in-house architectural tech support and a highly trained customer service staff. With more than 20,000 home plans from North America's most popular residential architects and designers, Garlinghouse offers plan modification services, building material estimates, materials lists, state seals and energy certificates on many of its best-selling plans.

Garlinghouse Company
1-800-235-5700
www.familyhomeplans.com

Protection Under the Deck

Increase the outdoor living space beneath raised decks. The new RainEscape deck-drainage system makes use of the otherwise unusable area where rainwater drips down through the deck boards. Unlike other deck-drainage systems, the RainEscape system is installed above floor joists, allowing them to remain completely dry and thus protecting the structural integrity of your deck. Just as important is the fact that the above-joist installation ensures a dry environment for the installation of electrical wiring, gas lines and soffits. Comprised of durable 20-mil, UV-protected plastic components, the system can be installed easily on any new and most existing decks. RainEscape is built to last; it is not subject to the accumulation of debris or freezing, it is also much less expensive than similar systems and is backed by a 20-year limited warranty. Builders and homeowners can add living space, improve their lifestyle and increase home resale values.

RainEscape
1-877-348-1385
www.rainescape.com

Energy-saving, Low-maintenance Siding

InsulPlank insulated vinyl siding from Mitten features solid construction, a tough polymer exterior and a "true flat" design that makes it a great alternative to costly wood and fiber-cement exterior sidings. The foam-backed siding increases insulative R values and is specially treated for insect and mold resistance. InsulPlank lays straight, laps tight and never needs painting. Its unique StakLoc design is tested to withstand winds up to 200 mph. And, InsulPlank's rich "just painted" cedar finish is backed by a lifetime, non-prorated limited warranty.

Mitten
1-800-265-0774
www.mittenvinyl.com

Lightweight Gas Blower

At just 7.9 pounds the new MightyLite handheld gas-powered blower is one of the lightest blowers in the world. Designed by manufacturer Homelite to be a lightweight alternative to heavier blowers and cut down on user fatigue, the unit powers at rates of 275 cubic feet per minute and delivers a strong 170-mph air speed. The MightyLite blower comes equipped with a 26-cc PowerStroke engine and Rotochoke—an easy fingertip pull start that makes starting quick and efficient. All MightyLite outdoor products are available exclusively at The Home Depot.

Homelite
1(800) 242-4672
www.homelite.com

Revolutionary Carpenter's Pencil

The *EHT* staff doesn't throw around the word "revolutionary" often, but C.H. Hanson's latest concept in carpenter's pencil is one we have not seen before. The new SuperPencil is a carpenter pencil in design; the rectangular shape allows users to mark either sharp or wide lines and prohibits the pencil from rolling, even on steep inclines. Where SuperPencil deviates from the norm is that 100 percent of its surface is a writing surface—no wood enclosure—and it lasts seven times longer. The SuperPencil is made entirely from non-toxic, graphite composition that marks wood, paper, concrete and many other materials, and its lines are water and smudge resistant. The extremely durable graphite never needs sharpening, which is a tremendous time saver when making multiple marks or marking on harder materials.

The C.H. Hanson Company
(800) 827-3398
www.chhanson.com

Portable Jobsite Heat

One of the greatest challenges of working in cold weather is heating the jobsite. New for this winter's working season, DESA Heating's Pro-Tough series features a professional-grade, workspace-friendly, versatile-fuel, forced air heater. The Pro-Tough heater weighs less, operates more quietly and is more maneuverable and portable than traditionally designed forced air heaters. Fuel options include kerosene, diesel, jet fuel and fuel oil. With a design inspired by the wheelbarrow, the Pro-Tough series is easy to transport and reduces the risk of injury or back pain resulting from carrying old heaters. The Pro-Tough series, which operates 15-percent quieter than older models, includes a 13.5-gallon fuel tank for extended running time before refueling. The larger tank allows even the 100,000-Btu model to run for up to 18 hours and heat 2,400 square feet. The series also includes models in 150,000- and 200,000-Btu output for heavy-duty, on-the-job heating needs.

DESA, LLC
1-866-672-6040
www.reddyheat.com

Sturdy Three-Legged Sawhorse

The Clydesdale sawhorses are three-legged aluminum sawhorses that combine with a 2-by-10 and 2-by-12 plank of any length up to 24 feet. A long hinge attaches the third leg to the stand and is secured in place with a pin that prevents it from inadvertently folding. When not in use, the third leg folds flat for convenient storage. Using the engineering principles of I-beam strength, the Clydesdales are rated at more than 600 pounds, and are so strong they have held the full weight of a 6,400-pound truck. And unlike custom-built or purchased sawhorses, the Clydesdales require no assembly or reassembly to relocate or turn corners on the jobsite. The rubber-padded feet add stability on flat surfaces and protect finished flooring on inside jobs.

The Clydesdale Sawhorse
(708) 705-2112
www.clydesdalesawhorse.com

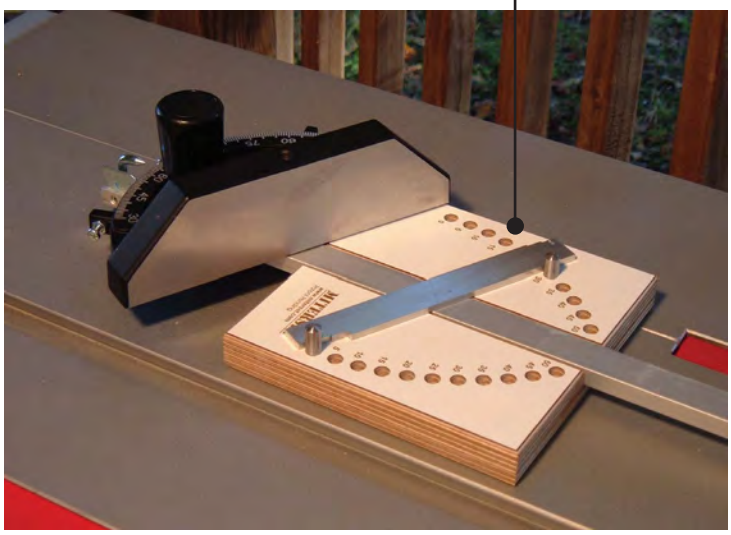
Small Driver, Plenty of Power

The first thing you notice about Milwaukee's new 12-volt compact driver, is its diminutive size, but don't let that fool you—it packs a punch. The *EHT* staff tested the unit on several different tasks, and it performed like you would expect from any tool bearing the familiar red Milwaukee colors. The first test involved driving 3-inch decking screws into treated lumber, and it performed with no signs of strain or battery depletion after driving 50 screws. Next, the driver was fitted with a 1/2-inch spade bit and used to drill several holes into treated landscape timbers. We then inserted a 1-inch spade bit to intentionally exceed the tool's stated size limit, and surprisingly, it was able to drill through 2-by-4 treated lumber. (We don't suggest exceeding the tool's capacity, but it's nice to know it has the power.) The driver's small footprint and light weight lend it to those occasions when you are working overhead, or any other time when the heavier cordless units prove to be tiresome.

Milwaukee Electric Tool
1-800-SAWDUST
www.milwaukeetool.com

Perfect Miters Every Time

The MiterSet miter-gauge setting fixture ensures precision miter cuts for the woodworking enthusiast. The key to the tool's success is the precise placement of the guide holes in relation to the guide-bar slot. On both the right and left side, holes are machined on a 10-inch diameter circular arc, which is very large compared to most miter gauges and results in exceptional accuracy. To set any angle from zero to 50 degrees (in 5-degree increments), simply place a dowel pin in the left or right pivot hole (zero degrees) and another dowel in a sector hole on the opposite side, at the desired angle. Slide the miter gauge into the fixture against the dowels and set it. You can also set any degree from zero to 52-1/2 degrees in 1/2-degree increments. To do so, set the dowels closest to the desired angle. Using the step-bar accessory, place the detent of the bar on the sector dowel to add value to the angle. Place the step bar detent on the pivot dowel to subtract from the angle. Then just slide your miter gauge against the bar and set it. This is a great tool for precision cuts, such as making an eight-sided picture frame where each miter should be cut to 22-1/2 degrees.



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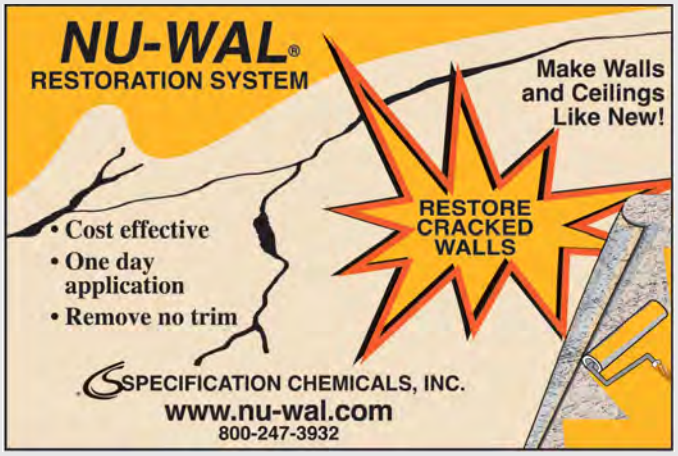

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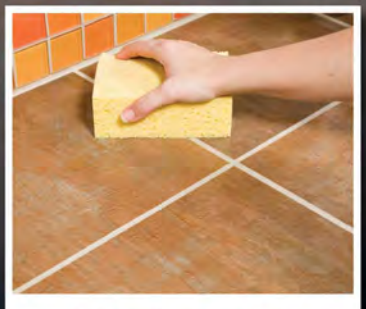

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